The Builder.

No. CCCCLI.

SATURDAY, SEPTEMBER 27, 1851.

SOME interesting and important experiments on the strength of cements, &c., were made on the 20th, 22nd, and 23rd inst., at the Great Exhibition, under the supervision of the jury of Class XXVII., when the large beam of hollow bricks and Portland cement, erected in the area at the west end of the building by Messrs. J. B. White and Sons, of Millbank, was broken down. The experiments were watched with great interest by a large number of scientific men and others. Confining ourselves for the present to the works of the firm we have named, we will record some of the experiments which preceded the attack on the beam. The weights used were iron pigs, averaging 100 lbs. each.

The first experiment was on a block of neat Portland cement 4 inches square, suspended at each end, and 16 inches long between the bearings. The weight was applied exactly in the centre. This was broken down by 1,580 lbs., including the weight of the scale: the fracture was perpendicular. The block was four months old.

2. A block of neat Roman cement (Harwich stone), exactly the same size as the last, seven months old, broke down with 380 lbs. This must have been defective, and we may say, as applying throughout, that single experiments on the strength of materials must never be trusted to for general deductions, the most extraordinary variations being often found in specimens prepared under, what may be considered, precisely the same circumstances.

3. A block of neat Sheppy cement, the same size as the last, broke with 980lbs. in the scale.

4. A block of neat Portland cement, six months old, 2 inches thick, and 2¾ inches wide, required 2,280 lbs. to pull it asunder.

5. Two pieces of Portland stone, 6 inches square (each 6 inches high too), cemented together by a thin joint of neat Portland cement (four months old), were suspended. When 3,700lbs. were in the scale attached to the lower stone, the top stone yielded where the iron clippers held it. Afterwards the square holes for the ends of the clippers were made deeper in another part of the stone, and 4,500 lbs. were put into the scale, when the iron hook broke, the joint remaining sound.

The materials here used being Portland *stone* and Portland cement, it was with difficulty that some of the foreigners present could be made to understand that the latter was not made from the former, and we mention the circumstance as an illustration of the erroneous impressions given by improper appellations. It is the same with Roman cement. A scientific French writer in describing that marvellous piece of construction, the Thames Tunnel, deceived by the name, says that the engineer succeeded here by adopting *the cement of the ancient Romans*, although, as we know very well, the cement in question which really was used had no more to do with the Romans than it had with the Pope.

6. Two pieces of Portland stone, the same size as the last, joined together with Roman cement, five months ago (a thicker joint, by the way, than in the previous case), required 2,780 lbs. (including scale) to separate them,—a much greater weight than was anticipated. The cement left the stone; so that its adhesive power yielded, not its cohesive.

Turning now to the principal example of the series,—the hollow-brick beam,—we annex views of the front and end of it, showing its dimensions and construction, and the mode of applying the weight.

During Saturday the beam was loaded in the central part with 15,000 lbs. weight of pig iron, and in this state it was left until one o'clock on Monday, when it was carefully examined and found quite free from any indication of failure. The loading was then resumed until it was weighted with 40,000 lbs., at which time a deflection of nearly one-eighth of an inch was observed: with 41,600 lbs. two cracks exhibited themselves in the four lower courses, at a short distance right and left of the centre of the beam, and then a crack in the centre of the beam. With 51,600 lbs. the cracks extended through the six lower courses and the deflexion increased to five-sixteenths of an inch; with 62,800 lbs., which it bore for a short time, the beam gradually separated into two parts as nearly equal as possible, the line of fracture being vertical and indiscriminately through bricks and joints as they occurred. In falling, the beam thrust the piers considerably out of an upright.

It will be remembered by many that in 1837 an experimental brick beam was (at the suggestion of Mr. Brunel) built by Messrs Francis and White, at their cement works, Nine Elms, Vauxhall, for the purpose of ascertaining the strength of Roman cement. The beam consisted of hard stock bricks, bonded in the usual way, and bedded and grouted with a mixture in equal portions of the best Roman cement and clean Thames sand, making it completely solid throughout. It consisted of nineteen courses of bricks, the thirteen uppermost courses being two bricks, or 18 inches, in thickness, and the six lower courses two-and-a-half bricks, or 1 foot 10½ inches, in thickness. The sectional area was, therefore, thirteen courses, at 3 inches each, = 39 inches × 18 inches thickness = 702 inches; six courses, at 3 inches each, = 18 inches × 22½ inches thickness = 405 inches, total sectional area 1,107 superficial inches, and in the lower courses were inserted (as we understand) fifteen lengths of hoop-iron, 1½ inch and $\frac{1}{16}$ inch.* The beam was supported at each end, leaving a clear bearing of 21 feet 4 inches, and after it had been built about *three months* it was loaded with 11,200 lbs. of pig iron, placed on a platform, which was suspended at the central part of the beam, which weight was increased at the end of another three months to 24,000 lbs. In this state it was left for twelve months, at the termination of which period it was determined to load it until it broke down, which was effected by increasing the weight to 50,622 lbs.

Messrs. White and Sons had determined, *for the purpose of exhibiting the strength of Portland cement as compared with Roman cement*, to erect a brick beam in all respects similar to the last described (except the substitution of *Portland* for *Roman* cement); but a short time previously to the opening of the Exhibition, it was suggested to them that if they made use of hollow bricks instead of the ordinary solid bricks, it would add much to the interest of the experiment (as experiments upon hollow bricks were much wanted); and in compliance with this suggestion, they erected, a few days before the opening of the Exhibition, *a beam of hollow or tubular bricks, with Portland cement and sand (in equal portions)*, with iron hooping in the lower courses, and generally following, in all respects, the dimensions and form of the beam built with Roman cement at Nine Elms, as far as the use of the hollow bricks would permit. The weight was applied in the central part of a clear bearing of 21 feet 4 inches, in the same manner as to the Roman cement beam. The use of the hollow bricks occasioned some difference in the sectional area, which we have to take into account; but we shall disregard in the present comparison the disadvantages arising from having merely the narrow edges of the tubes to connect with the cement instead of the broad surfaces of ordinary bricks.

The Portland cement beam, as will be seen by the accompanying diagrams, consisted of ten courses, the upper part having three courses on edge, and four flatwise, and the lower part two courses on edge, and one flatwise. The bricks were all laid as stretchers, and the beam consequently consisted of a series of forty tubes (the number of bricks in section throughout), which were open from end to end of the beam. The average size of the bricks was 5¾ inches by 4⅛ inches, and, the rims or sides being about $\frac{7}{8}$ of an inch in thickness, the tubular or hollow parts were each equal to 9 inches super. But with the joints and beds the whole measured in the six upper courses an average of 36 inches × 17.25 inches, = 621 inches; and in the three lower courses an average of 16.5 × 26.6 inches, = 439 inches; making a total area of 1,060 inches: from this deducting the forty vacuities, or hollow parts, of 9 inches each, = 360 inches, we have, as the net sectional area, 700 inches.

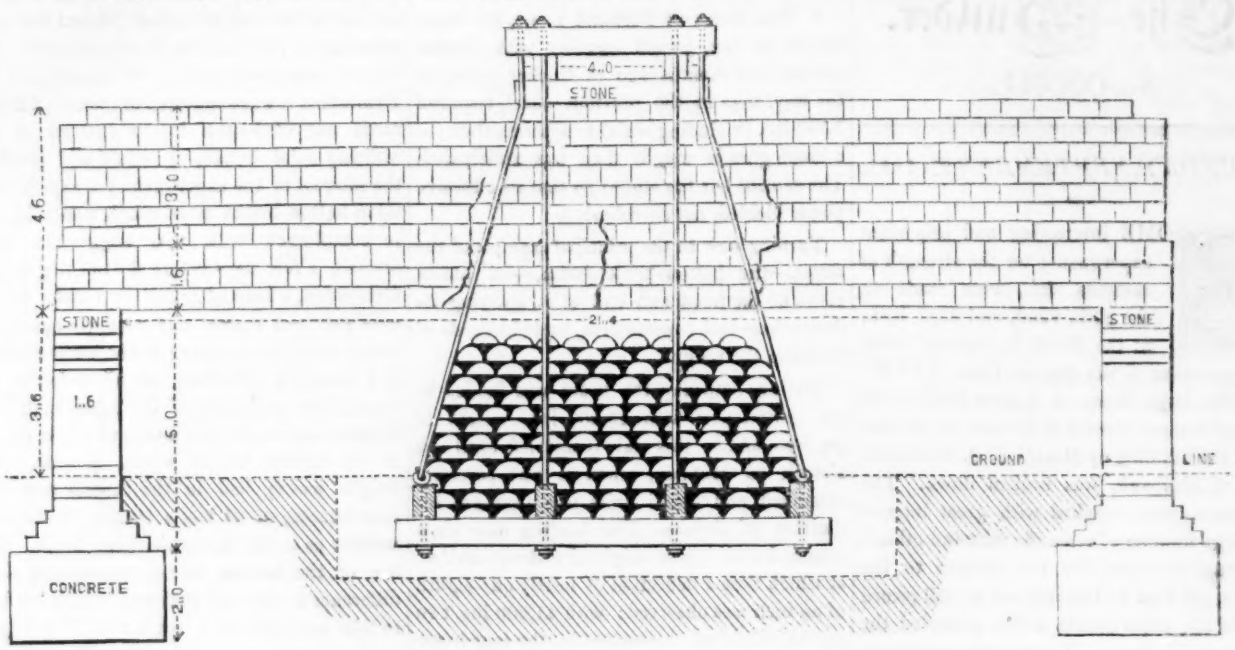
By an inspection of the diagram it will be seen that as the vacuities are distributed throughout the whole depth of the beam, they occasion a loss of strength nearly proportionate to their whole extent, varying of course as their distances from the neutral axis.

On the part of Messrs. White it is argued that the depth of the Roman cement beam being 57 inches, and the sectional area 1,107 inches; and the depth of the Portland beam being 52½ inches, and its net area, 700 inches, we shall have 1,107 × 57 = 63,099; and 700 × 52½ = 36,750, as expressions of the relative strength of the two beams, supposing they had been built of the same materials.

The *Roman* cement beam (as before mentioned) was broken down with 50,652 lbs., and since 63,099 : 36,750 :: 50,652 : 29,500, it follows that if the *Portland* cement beam had broken down with 29,500 lbs., the two cements would have exhibited equal strength; but, inasmuch as it took 62,800 lbs. to break down the *Portland* cement beam, the experiment exhibited a superiority of *Portland* cement over

* General Pasley says, in his work "On Limes," five only, p. 162.

Brick Beam of Hollow Bricks and Portland Cement erected at the Exhibition Building May 1851, *by J. B. White and Sons.*



DIMENSIONS.

Neat length ....24 ft. 4 in.
,, length ....21 ft. 4 in. in clear of piers.
,, depth .... 4 ft. 6 in.
,, thickness.. 2 ft. 3 in. bottom, and 1 ft. 6 in. upper part.

Built of equal parts cement and sand; completed, 12th April; centres struck, 22nd April.

CONSUMED:

1,200 hollow bricks, weight..	10,750 lbs.	
32 bushels cement	6,400 ,,	
32 ditto sand		
		17,150 lbs.

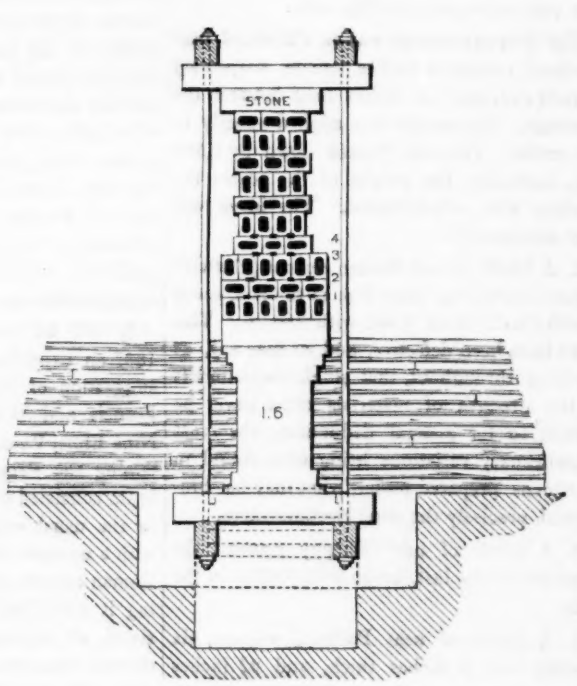
If built in common bricks would require—

2,700 stock bricks, weight..	13,420	
50 bushels cement (Roman)	8,000	21,420
50 ditto sand		
difference		4,270 lbs.

Weight of scale and iron work..	1,792 lbs.	
,, of stone	672 ,,	
,, of beam in suspension between piers	15,000 ,,	
		17,464 lbs.

In common bricks:

Scale and stone	2,464	
Net weight of beam	18,743	21,207 lbs.
difference	3,743 lbs.	= 1 ton. 13 cwt. 1 qr. 19 lbs.



Roman cement in the ratio of 2.128 to 1, or, in round numbers, $2\frac{1}{8}$ to 1. This reasoning, however, is scarcely correct, since it does not take sufficiently into consideration the strength dependent on *disposition* of the material.

From some experiments made upon Portland and Roman cement, where solid bricks were used with each, the superiority of Portland cement was found to be much greater than this is shewn by experiment, — but when we consider the nature of the structure, and take into account the circumstance of the *Roman* cement beam having been built *seventeen months* before the breaking weight was applied, whereas the *Portland* cement beam had been only erected *five months*, we are not surprised that the experiment with the hollow bricks did not exhibit the full strength of the Portland cement. It is to be regretted that hollow bricks were used, as it would have been better to have rested the comparison upon two beams as strictly analagous as possible, instead of complicating the subject with conditions that are extraneous to the immediate inquiry.*

The important part played by the iron bond in this experiment must not be overlooked. Sir Charles Pasley, in his work on cements, describes two beams constructed by him for the purpose of ascertaining, how much of the extraordinary resistance of brick beams built with cement might be owing to the hoop iron bond. These were precisely similar, with the exception that one of them had five pieces of hoop iron bond, and the other none. The latter cracked when the centering was removed, and was broken by a weight of 498 lbs., while the first sustained a weight of 4,523 lbs. before it yielded. "The mutual adhesion of the cement and the iron," says that author, "is so perfect, that no force can separate them without producing the complete fracture of the brickwork, which is thus resisted by all the tenacity of the iron."

The tensile strength of wrought iron per square inch of section, may be called 27 tons. The mean of Mr. Telford's experiments gave 29 tons, as did some conducted under our own superintendence. Mr. G. Rennie says 24.93, and Capt. Brown 25 tons.*

In the hollow-brick beam there were fifteen pieces of hoop iron bond, one-and-a-half inch by one-sixteenth of an inch, nearly; namely, four in the first course, four in the second, three in the third, and two in each of the next.† The pieces of iron were all broken, except one in the bottom course, one in the second, and one in the top course.

This very interesting proceeding suggests many observations, but we must now pass on to the experiments, also on Portland cement, which were exhibited on the same occasion by Messrs. Robins and Aspdin, of Scotland-yard.

* Hollow bricks are usually better moulded and more thoroughly burnt than ordinary stocks.

* Eight or nine tons may be considered a safe load-strength.
† In the diagram, by mistake, only fourteen are shown.

1. A suspended block of cement, 3⅞ inches wide, and 2½ inches thick (one month old), was pulled asunder by 3,240 lbs., including the weight of the scale.

2. Sixteen stock-bricks, attached to each other with neat cement, supported at one end, and projecting from the bearing point 3 feet 2½ inches, broke in the eleventh brick with 256 lbs., exclusive of scale, suspended on the extreme end.

3. A solid step, 6 feet 5 inches long, and 7¼ inches deep at the back, formed of two parts Portland cement and one part broken bricks, held up at one end, carried itself, and broke off close to the bearing-point when the third 56 lb. weight (168 lb.) was placed on the extreme end. The weight of the step was called 4½ cwt.

4. Two blocks of neat cement, 1 foot 5½ inches long, 9 inches wide, 4½ thick, cemented together with neat cement, bore 6,000 lbs., when the lower part of the lower block gave way.

5. Twenty stock-bricks, united side by side with cement, composed of one of cement and one of sand, 3 feet 6½ inches in bearing, were supported at each end by iron clamps: the weights being applied to the centre, the bricks broke with 1,200 lbs.

6. Six fire-bricks, in courses, cemented together with pure cement, were suspended, and weights were applied to pull them apart: the upper brick broke with 2,836 lbs. in the scale.

7. The five fire-bricks from the last trial were again tested, iron being inserted in the second brick from each end: the upper brick broke, carrying away also part of the lower, with weight of 4,600 lbs.

8. Two pieces of Portland stone, 2 feet by 11½ inches, 7¾ inches thick, cemented together with neat cement, took a weight of 7,272 lbs.; when the lower stone yielded, carrying away a small portion of the cement joint.

Our readers will find other experiments on the same material, both by Messrs. White, and Sons, and Messrs. Robins and Aspdin, in our sixth volume, pp. 343, 351, and 471.

MINERAL PRODUCTS IN CLASS I. OF THE GREAT EXHIBITION WHICH RELATE TO THE BUILDING ARTS.*

GRANITES.

BESIDES the Cornwall and Devonshire granites and porphyries which have been noticed, the Exhibition contains representatives from most of the localities in the British Isles. Thus we have a specimen of the granitic, or rather syenitic, rock from mount Sorrel in Leicestershire, in which the mineral called hornblende is substituted for the mica. This stone is commonly used for walling, road-pitching, and as a covering of broken stone where a very hard surface is required, as on the roads near London. Scotland is represented by the Barnton Mount granite from Edinburgh, by the Aberdeen granite, by the two kinds of Peterhead granite, by the granites of Argyleshire and the Isle of Mull, by that from Kirkcudbrightshire, and by the Glenorchy and Loch Etive granites and chlorite slates. The Barnton Mount stone is unlike most other granites, being a greyish uniformly coloured variety, compact and fine grained, can be procured in blocks of any size, and would, perhaps, be more extensively used if it were not for the proximity of the celebrated Craig Leith, Red Hall, and Carlingnose quarries, which furnish stone, perhaps of equal durability and certainly easier, and less expensive to work. The Aberdeen granite is generally fine grained, crystals small and undefined, colour a pleasing speckled black and white, in which the two are about equally mixed. This granite is well adapted for curb-stones, street-pitching, and for the larger class of hydraulic works, and has been used in Sheerness Dock and other works. It is also used for statuary and for a variety of ornamental works. Owing to the very crystalline structure of this granite and the metallic lustre of the mica, it takes a very beautiful polish. Specimens of Aberdeen granite may also be sometimes seen with a light pink tinge of colour, derived from the felspar. The Peterhead granite, is of two kinds, one termed the red granite the other the grey. This difference is occasioned by the colours of the felspar. Like the Aberdeen granite they are both susceptible of a very beautiful polish. The Peterhead granite has been used in Trafalgar-square, the British Museum, and the Carlton Club-house, and is well adapted for sculpture and statuary. Besides the use made of the Aberdeen and Peterhead granite for building, paving, and statuary purposes, it is also, by the aid of the lapidary, manufactured into a variety of small articles, for which its beautiful polish admirably adapts it. For instance, it may be met with in the first shops of Edinburgh and elsewhere, handsomely mounted in the shape of pencilcases, penholders, bracelets, brooches, necklaces, handles for paper-cutters and other knives, studs, buttons, seal handles, paper-weights, &c. Considerable employment might be obtained by working up the beautiful granites of Devon and Cornwall, especially those of Dartmoor, into similar articles. The *Encyclopædia Britannica* states that granite stones to the value of 30*l.* to 50*l.* have been raised from an acre of ground under preparation for tillage in Aberdeenshire, and sold for paving the streets of London; that the exportation of granite to the capital from this country employed at one time 400 men and 70 vessels of 7,000 tons burthen, and that the value of all the granite exported yearly was stated at 40,000*l.*

The Argyleshire granite from Inverary is very compact, greyish coloured, with black specks, and is much recommended for street-pitching. The Bonar granite varies from a very fine to a coarse grain; the prevailing tint a clear black and white, not so grey as the Inverary. The Argyleshire granite from the Forest of Glenorchy contains pink-coloured crystals of felspar. The Isle of Mull granite very nearly resembles the red variety from Peterhead. The specimen from Craignair Quarry, Kirkcudbrightshire, is a black and white variety, with moderately sized crystals not well defined, mixed with largish light pink crystals. This is a strong, compact, highly crystalline granite.

The Glenorchy and Loch Etive granites will be found in No. 7: some of these are mixtures of white felspar and quartz in moderately sized crystals, with black mica or schorl. In other specimens, where the felspar is still white, the grain or crystallization is much finer. In others, the felspar is flesh-coloured, the tint varying in intensity in different blocks, and sometimes even attaining a scarlet red. Sometimes, but in few specimens, the felspar is decomposed. The same number contains specimens of garnets, chiefly of small size, probably procured from micaceous schist, in the neighbourhood of the granite: there are also specimens of chlorite slate from the quarry near Taymouth, which furnished the stone for building the castle of that name. The stone is a light faded green colour, with very fine lamination, and a very smooth surface when dressed. Inverary Castle, the seat of the Duke of Argyle, is also built of chlorite slate.

The channel islands of Herm, Guernsey, and Sark, as well as the Orkneys, furnish specimens of their granites. The channel islands granite has frequently very large crystals of pink-coloured felspar. Other varieties from Herm and Guernsey have a very dark green base, with whitish crystals of felspar. These are excellent for street pitching, and are also very extensively used in the broken state for metalling the surface of the metropolitan roads. The granite from the Orkneys has a cloudy, indistinct appearance on the surface, having large masses of white and black much intermixed, and sometimes intersected by long straight veins. The Herm granite is also much used for steps and curb-stones, and was employed for the steps of the Duke of York's column, and for the blocks of the tramway laid down in the Commercial-road for the heavy traffic to and from the West India Docks.

The Irish granites are represented by specimens from Dunleary, and from Carne, in the county Wexford. The Dunleary and Kingstown granites resemble that of Aberdeen, except that the colour is lighter, the white tint prevailing to a greater extent. The Wexford granite is porphyritic, sometimes very fine grained, with sparry white crystals in a dark green ground, sometimes with pink crystals of a larger size and coarser crystallization. No. 160 contains some beautiful blocks of serpentine from Connemara, in the county Galway. This exquisitely variegated marble is in two blocks, each of which is about 5 feet long, by 2 feet 6 inches wide, and a foot deep, one face of each being polished. This serpentine is exceedingly well adapted for ornamental work, and has even been exported from the coast of Galway to New York. No. 155 also contains a beautiful specimen of serpentine from the Darcy estate, near Clifden, Connemara. This marble is also exported in considerable quantities. No. 142 contains specimens of green granite from Rossmore, county Monaghan. This has a black ground, with numerous green crystals (felspar?) of all sizes up to one inch by a quarter of an inch. In one specimen the crystals are smaller. Well adapted, when polished for interior ornamental work.

BUILDING STONES OF THE OLD RED SANDSTONE AND DEVONIAN SERIES.

Although a vast extent of country is comprised within this geological formation, yet the specimens of building stone sent up to represent it are comparatively few, and with one or two exceptions are confined to Devonshire. The old red sandstone nevertheless contains many quarries of building stone, but they are little valued locally, chiefly because superior stone frequently exists in the same neighbourhood. Hence, with the exception of a single specimen from the neighbourhood of Hereford, another from Tortworth, in Gloucestershire, and one from Bristol, not much used for any purpose but common fence walling, the old red sandstone is quite unrepresented. We have a specimen of sandstone from the neighbourhood of Taunton, which probably belongs to the rocks of the Quantock Hills, and the other stones classed under the head of the Devonian series are from the coralline limestones of Plymouth and the south-east of Plymouth.

The specimen from near Hereford is No. 194 in Catalogue, from Jennings' Quarry, Three Elms, Hereford. It is a moderately fine grained stone of a yellowish cream colour, and dresses with a clean, sharp arris. It is used in the neighbourhood for cider-mills, and is said to be suitable for sea walls, railway blocks, &c. It is said to stand equally well on its edge and on its bed, but this property is doubtful of any laminated stone, as wherever lamination exists there must be a tendency to scaling off when the stone is placed on its edge. This arises from the percolation of moisture which will be absorbed at the joints, will penetrate between the laminæ, and the action of frost will separate flakes or sheets from the face of the stone. The specimen from Tortworth (see No. 29) is also a grey variety, moderately fine grained, with particles of mica, and a somewhat earthy cement uniting the grains—weight per cubic foot 162½ lbs. The Bristol specimen (No. 29) is from the Avon defile, and underlies the great mass of mountain limestone exposed in that section. It is the ordinary dun red stone so extensively prevailing throughout the old red sandstone district, the colour being due to the peroxide of iron. The grains are not well cemented, and generally speaking the stone is of little value, except for rubble walling and buildings of an inferior class. The specimen from Bishop's Lydiard, near Taunton (No. 193), is the same dun red sandstone, but of somewhat

* See p. 587, *ante*.

better quality, and is extensively used for building in the neighbourhood.

The coralline marbles from Bradley quarry, near Newton Abbot, from Torquay, and from the neighbourhood of Plymouth (Nos. 160 and 193) are remarkable beds interstratified with the slates and old red sandstones of Devonshire, and are supposed by geologists to have formed ancient coral reefs. The specimen from Bradley quarry has a black crystalline base, with white veins intersecting it, abounding with such genera of polyps, as fenestella, retepora, lithodendron, cyathophyllum, astræa, porites, and favosites, the sections of which are very beautiful. It contains also numerous fossil shells, the inhabitants of which had found shelter under the edges of the coral reefs.

No. 160 also contains a very beautiful specimen of marble from Hoor Lake, near Plymouth, and No. 193 contains several other specimens from the neighbourhood of Plymouth. The marble is chiefly of a blackish colour intersected by white veins, and marked by numerous fossils, especially by the favosites and other corals. The Plymouth marble is much valued for interior pavements, &c. and was extensively used in the breakwater and in the works of Dover pier. The specimen from Kingskerwell, near Torquay (No. 193), is a white and pink variety beautifully variegated by the white sections of the fossils. The Devonshire coralline marbles are certainly not inferior either in beauty or durability to those of Derbyshire, or any others which this country produces. Ornamental specimens of them are to be found in various conspicuous parts of the nave, as well as in Class XXVII., showing their application in the manufacture of chimney-pieces, fonts, tables, columns, &c. (see Nos. 4, 6, 39, 55, 108 of Class XXVII.) They may also be well studied in the Museum of Economic Geology, where they are shown both in a rough and polished state worked into various forms.

BUILDING STONES OF THE CARBONIFEROUS LIMESTONE.

The vast oceanic formation known under this name, constitutes, in English Geology, one of the best known varieties of rocks. Thrown up for the most part into a rugged mountain barrier, it surrounds every one of our coal fields, and the basin of the carboniferous limestone forms the vast trough in which thousands of feet in thickness of grits, shells, and carbonaceous layers termed the coal measures are now found reposing. Every true coal field has its surrounding and underlying mass of carboniferous limestone, and not a few have contributed specimens to the Great Exhibition; but it will be advisable first to say a few words on the general nature of this limestone, and the economic uses to which it is applied. The part of the carboniferous series usually termed by geologists the carboniferous or mountain limestone, is that thick mass varying from a few hundred to nearly 3,000 feet in thickness, lying between the old red sandstone and the millstone grit. This mass is composed in its lower part of alternations of limestone and shale: then succeeds a great central mass of nearly pure compact limestone, having every variety of colour, from the lightest grey to the most intense black, and also a great variety of structure. This is succeeded in the upper part of the formation by alternations of limestone beds, with grits and shales, which gradually lead up to the millstone grit, or farewell rock, so termed in some coal fields, because it forms the boundary beneath which workable coal is no longer found. It is chiefly with the central mass of compact limestone that we are at present concerned, as this is the one chiefly used for economic purposes. The stones of the carboniferous limestone are not much used for buildings of a superior character, nor even for ordinary housebuilding, probably on account of their liability to absorb water, and their consequent dampness. The Derbyshire marbles from this formation, however, are much used for interior decoration, and the beautiful polish of which most of the beds are susceptible, should draw attention to the fitness of numerous beds in this limestone for columns, sills, flooring, and many ornamental purposes. The stone is much used locally for building rubble walls, and for inferior ashlar. It contains a very large per-centage of lime, and therefore burns very economically into quick lime; and many of the more argillaceous beds undoubtedly possess hydraulic properties. The stone is also much used locally for mending and repairing roads, but should never be employed for this purpose except in situations where good drainage exists, as it will make a good road when tolerably dry, but when used in hollows and on heavy clay lands, where the drainage is defective, it frequently makes execrable roads. When burnt into lime, it is highly valued by the agriculturist, as it answers for the amelioration of clay soils much more effectively than the poor weak limes. Probably no mortars are superior to those made from the mountain limestones: the lime should, however, be compounded with ashes or some very dry and gritty variety of pit sand. These limestones are also much valued locally as a flux for smelting iron ores, and even in ordinary cast iron foundries the use of mountain limestone in the cupola will much facilitate the running of the metal. There are other uses of less importance to which this stone is applied, such as paving and curb stones, also in its broken state for garden and park walks and paths; but the above are the principal uses that are worth mentioning.

The exhibition contains specimens of mountain limestone from the Durham coal field, from the northern extremity of the Clee Hill coal field in Shropshire, from the great Orme's Head, probably connected with the coal field of Anglesea, from Buckley mountain, adjacent to the Flintshire coal field, from the Isle of Man, from the great Midland coal field, near Derby, and many specimens from St. Vincent's rock in the defile of the Avon, the Mendip Hills, and other parts of the Bristol and Somersetshire coal field. So large and varied a contribution of this particular limestone will display its uses and application to a variety of purposes, and I now proceed briefly to notice the principal localities in the order of their geographical arrangement. The first is a specimen from the mountain limestone of Wear Dale, with a beautifully polished surface nearly black and variegated by large sections of fossils probably turbinolia, or some other description of coral lying with their stems inclined at an angle with the bedding or stratification of the stone. If this specimen (No. 204 in catalogue) be a fair representative of the quarry, the stone is highly ornamental, and has few superiors in this country. No. 156 is also a beautiful specimen from Wear Dale, shewing sections of astræa, caryophyllia, and turbinolia. The specimen from the Clee Hill coal field (No. 189) is described as oolitic limestone, from the Oreton Bank works, and referred to in the illustrated catalogue as a remarkable instance of an oolitic limestone being sufficiently hard to take a good polish. The fact is, this is not an oolite at all as that word is generally understood, but simply a bed of oolitic limestone from the carboniferous series; that is to say, a bed of mountain limestone with an oolitic structure. There are plenty of such beds in the mountain limestone which are sufficiently hard and crystalline to take a polish: in fact, as far as we are aware, all the oolitic beds of the mountain limestone are capable of being polished. The specimen in question is a very light cream-coloured greyish stone, abounding with fossils and oolitic grains imbedded in a crystalline cement. The polish is not very brilliant, but would probably wear tolerably well, if protected from atmospheric influences and from accidental injury. The specimen from Great Ormes Head (No. 194) is from Ross quarry—a pale bluish-grey variety of limestone, which takes a very smooth surface and good polish, but is not sufficiently variegated for ornamental purposes. In No. 194 also is included the specimen from Buckley Mountain adjoining the Flintshire coal field. This is also a bluish-grey variety with a somewhat deeper tinge of colour than the last specimen, and is exhibited not as a marble or building stone, but on account of its properties as a hydraulic limestone. It probably, therefore, contains a small admixture of argillaceous matter in combination with lime, in which circumstances, according to the experiments of Vicat, lime possesses the property of hardening under water. Many other beds of the Buckley limestone are highly crystalline, and will admit of a very fair polish.

The specimens from the Isle of Man consist of black and grey varieties from the southern side of the island where they occupy a space of about sixteen square miles, covered for the most part by tertiary gravel. Amongst these is a variety of flag stone (*posidonia schist*), from which the steps of St. Paul's cathedral were supplied. They were presented for that purpose by the then Bishop of Sodor and Man. The flag stone resembles some of the beds worked in the black rock at Bristol, and the quarries have been worked for several hundred years. The stone is extensively used for flooring, chimney-pieces, tombstones. A specimen is shewn with an inlaid pattern of red cement, in imitation of encaustic flooring. The specimens of grey and black marble take a good polish, and the former has been used in building Castle Rushen (900 years old), King William's College, St. Thomas's Church, Douglas, and Castletown pier. No. 193 contains specimens of encrinital black marble from St. Vincent's rocks near Bristol, but by far the finest collection of specimens from the carboniferous limestone of the British coal field is comprised in No. 29, which contains twenty specimens from a great number of beds in the defile of the Avon below Bristol. All these specimens are polished on one side, and present a great variety of beautiful marbles, differing much in their structure and in the fossil remains which they contain. Some of the beds have a strikingly marked oolitic structure, the fracture much resembling that of the true oolites, except that the stone is harder, and the cement in which the ova are imbedded is more crystalline than in the true oolites. Many specimens are beautifully veined by streaks of different coloured carbonates of lime which have filtered into their cracks. Many beds appear to be almost entirely composed of fossils: some of these are encrinital, so called from the abundance of encrinital stem which they contain: others are coralline, containing caryophyllia and favosites in abundance, while others are filled with the shells of molluscs of the genera spirifer and producta, and some beds are entirely composed of terebratulæ. These fossiliferous beds all yield sections of singular beauty and variety, according to the general disposition of the fossils, whether at right angles or at other inclinations to the plane of stratification. Many of the beds contain fragments of red jasper, which give a pleasing variety to the polished surface, while others contain angular and broken fragments of older limestones of the very same series which appear to have been consolidated and afterwards broken up before the deposit of the succeeding layer. Mr. Howard, C.E., the collector of the very extensive assortment of Bristol minerals, has added to his specimens of building stones the weight per cubic foot of each specimen, and from the statements thus furnished by him it appears that the carboniferous limestone of the Avon rocks varies in weight from 162 to about 175 lbs. per cubic foot.

The specimen of marble from the Mendip Hills (also in No. 29) is a dull dark grey variety with white veins of carbonate of lime passing through it, but it is probable that these hills contain nearly the same varieties as the Avon defile. An inspection of the marbles exhibited from the Bristol district will naturally suggest the idea that they might be much more extensively employed for ornamental purposes. We believe them to be equally varied and beautiful with the Derbyshire marbles, and yet they appear to attract no attention, and give rise to no industrial employment either on the spot or elsewhere. It is true they are not adopted like the primitive granular marbles of Greece and Italy for statuary purposes, nor to preserve their polished surfaces exposed to the vicissitudes of a climate like that of Great Britain; yet for many pur-

poses of decoration, as for walls, flooring, columns, pilasters, ornamental tables, and slabs, chimney-pieces, mosaics, encaustic work, &c., they appear admirably adapted.

The Derbyshire marble is not well represented in Class I., the specimens merely consisting of a few black pieces unpolished, but prepared for the operation of the turner and his lathe. The mountain limestone of Derbyshire it is well known contains some beautiful varieties chiefly of black and encrinital marbles, which give employment to a great many persons in the neighbourhood who convert them into ornamental articles. Amongst the mineral manufactures in Class XXVII. are many beautiful specimens of the Derbyshire marbles manufactured into tables, chimney-pieces, clocks, inkstands, vases, jars, candlesticks, card-cases, paper-weights, card-baskets, inlaid chess boards, mosaics, models of obelisks, and pyramids, &c. &c. See Nos. 37, 38, 40, 76, and from 79 to 83, in Class XXVII. for Derbyshire marble worked up into these various articles. The Derbyshire alabaster or gypsum, is procured from fissures in the mountain limestone (see specimens in No. 146, Class I.) The famous Derbyshire fluor spar, or fluoride of calcium, is a beautiful and interesting mineral also found in the mountain limestone associated with Baryta, calc spar, and the ores of lead and zinc. The colours vary from amethystine to violet blue, with many beautiful shades of bluish and yellowish green; and Professor Ansted states that other colours may be artificially produced by heat and by sulphuric acid. Nos. 37, 38, and 40, in Class XXVII. contain many very beautiful articles manufactured from the fluor spar.

The Exhibition contains several specimens of carboniferous limestone, which possess no value in reference to building purposes, but are highly interesting in a geological point of view. One of these is specimen No. 5 of the Dublin calp limestone, exhibited by Dr. Lentaigne to show the very singular occurrence of granitic fragments in a bed of that limestone. The specimen is from the Crumlin quarry, near Tallaght, in the county of Dublin. Dr. Lentaigne states that the granite fragments in this quarry vary in size from a cubic foot to a mere speck. They are in most cases angular, and sometimes with sharp spiculæ, so as to make it very unlikely that they were conveyed by water. In some cases, the fragments were broken and slightly separated, so that the granite was crossed in different directions by veins of the limestone matrix, and in one specimen the granite is traversed by a vein of white carbonate of lime, which is continued into the adjacent limestone. The thickness of the bed in which these granite fragments are found is 15 or 20 inches, dipping 20 degrees towards the granite of the Dublin mountains, and upwards of four Irish miles distant from any granite formation. Another bed containing similar fragments was met with 50 feet below this, according to the statement of the workmen, but none have been observed in the intermediate beds. Nodules of silex are found in the quarry, but it does not appear whether in the same or other beds. The granite fragments in the specimens exhibited have the quartz and mica perfect, no hornblende, and the felspar quite decomposed. No. 6 in Class I. is a specimen of carboniferous limestone, entirely covered with large fossil shells of Productus.

RECORD OF THE INTERNATIONAL EXHIBITION.—The Bolton local committee have suggested the erection by the commissioners of a column and statue of Prince Albert, as their president, in bronze or other metal, either in the centre of the space now occupied by the Exhibition building or elsewhere; further, that they should erect with some portion of the building materials a new building for specimens, models, documents, &c., connected with the Exhibition, and obtain permission from the Commissioners of Woods to mark the site and dimensions of the present building, if it be removed, by the erection of inscribed monolithic blocks of stone.

MECHANICAL APPLIANCES IN ARCHITECTURE.

THE wholesale condemnation of mechanical appliances in art, recently attempted, is surely very erroneous. It is not mechanism, as such, which we should blame, but the use of mechanism as a directing power—invading the domain of man's spirit. Mechanism, so far from being subversive of man's success in art, is one of the principal means whereby his end is simplified and shortened, and is only to be condemned when it directs as well as aids. As to the gross wonder excited by the time and labour it must have taken to do certain feats, I do not think we less admire the swiftness of the steam-engine when we learn the cause, than if we were told that it was gained by amassed and unusual application of human strength: nay, the very contrary is the truth; and the smaller the cause to the greatness of the effect, is the just proportion of our wonder and pleasure. I would also animadvert on the use of the word "debased," as applied to any style: that which employed real artists, and is admired by men of cultivated taste, is not likely to be debased: we should remember what Gothic was some few years ago: what some now find glorious, Wood condemned as "debased" (the cathedral of St. Mark). We may own that there are fallings off from a certain metre of excellence, but until a style is without rule, life, or art, it cannot be called debased, or thrown from its pedestal. The cinque-cento of Italy is not a debased style, for it does not fall short of some perfect standard, nor is it the bad imitation of a good model. It exists *per se*, and is excellent for application to domestic purposes; but one would as soon think of using it for a severe and grand effect, as of writing an epic poem in lyric verse; or of planting a garden with aspens and looking forward to a pine forest.

Is liberty a lie?—is justice a phantom?—is progress a vanity?—No: nor though we fail seventy times seven in gaining them, do they still less truly exist; and their roots are as those of the young trees on the rocky mountain, firmly fixed, though storm and avalanche do their worst: the seed is sown, and will in time spring up, let us hope, into a goodly crop; and for this purpose we recognise machinery as one of the great engines of our success.

It is true that the penny pamphlet is not so fair to look on, as the monk-painted page; but which best serves to spread the generous thought, the mighty truth, the growing love? and can we now with conscience wish the machine destroyed that the hand may delight? True, the steam-engine is not so picturesque as the cavalcade,—the tunnel, as the mountain pass. Yet do these bind nations together where those bound individuals. It is not that which pleases most the artist's eye, but that which joins nations in mutual obligations which is most deserving of our admiration and most to be loved. It is individual man indeed who projects the poem, the statue, the painting; but it is machinery which renders it universal. And what commerce is to money, machinery is to art: the money suffers, and the superscription is effaced, but *man* profits. Art is not the end of art—utility to the human race forms its great claim on our consideration. To this end machinery works, and a mutual advantage takes place, for what man originates mechanism spreads, and what mechanism produces, human art should beautify; and this seems to me the natural action of each. Far be it from us, from any of us, to lose hope for all things: let us see in the present state of the world but a state of transition: what former ages originated, we perfect: what they perfected, we spread: the water was then deep, but flowed in few channels: it may now be shallow, but it fertilizes vast tracts of land.

The landscape of Claude is a finer work of art than the public panorama, but which does most service—affords widest pleasure? The statue is nobler than the cast, but which is of most general use? Not the super-eminence of a gifted few, but the progress of the people generally is the great object of *our* epoch; and when the manure has been more equally spread over the waste land, who can tell what sweet fruit in future years it may bear. Let us seek a Providence in all things: nay, let us firmly trust in it, and we shall do joyfully our appointed work: inferior it may be to the men of old, but strong in the belief of its purpose, *let us work*, not regretful of the past, but full of hope for the future.

J. B. WARING.

AMERICAN MATTERS.

The Astor Library, New York, according to the American papers, promises to be a fine building. It is in the Romanesque style of architecture, with an interior commodiously designed. Scarcely any wood has been employed in its construction, the floors of the second story resting on vaults turned in brick and covered with stucco. To give strength to the building, and avoid the danger of fire, a good deal of iron is used. The pillars, pilasters, capitals, and other ornamental parts of the inside are in stucco. The whole woodwork may be burned without destroying the building.

Art.—Mr. Elliot, a distinguished artist of New York, has received an order from one of the merchant princes of that city, but formerly of Syracuse, to paint 2,000 dollars worth of portraits, being twenty in number, of the original settlers of Syracuse. They are intended as a present to that thriving young city, to be placed in one of its public buildings.

The Fire Annihilator.—The American patent for Phillips's "Fire Annihilator" has been purchased by an association of capitalists and business men in the United States. The Hon. Elisha Whittlesey, First Comptroller of the United States Treasury, has been appointed president of the company. We hope it will be better managed than, according to our way of thinking, has been the case in England.

Paine's Gas.—Mr. Paine announces that, having overcome the objections of the patent office examiner, a patent for his new mode of rendering atmospheric air combustible, will issue in its proper order and time. In the meantime, he is ready to contract "to light hotels, factories, or private dwellings, with a superior light, fifty per cent. less than that of any other artificial light known." About six weeks ago his application for a patent was rejected, on the ground that the invention claimed was identical with that of Mansfield's, patented in England in 1848.

Dr. Bethune's Church, Brooklyn, New York.—This is an edifice now in progress of erection for the Central Dutch Reformed Church Society. Its architecture is described as a combination of several of the classic styles. It presents two fronts, the principal one of which is located on Pierrepont-street, the other on Munroe-place: the former has for its façade, projections of 5 feet from the flanking sides, composed of four pilasters on pedestals which support the pediment and all the parts that appertain to the Roman Corinthian order. Both fronts are of brown stone, from Conn and Baldwin's quarries, near Newark, New Jersey. There is a lot on the corner 25 feet by 100 feet, on which a parsonage is to be built. The two fronts will appear to form two distinct designs. The design of the steeple is singular in form and details, and to some extent original; but when it is finished it is believed that it will be free from any inconsistent or distorted features. The extension of the building is of the Roman Corinthian order, and contains ten columns and twenty-four pilasters standing upon pedestals. The ceiling is formed of longitudinal and transverse-segmental arches, over and on the cross of which stands a dome 36 feet in diameter, resting on pendentives. The segmental arches, pendentives, and dome are highly ornamented with large and bold panels and rich mouldings. The interior is to be lighted by plates of glass 4 feet by 5 feet, and three-eighths of an inch in thickness, fitted in the roof; through which the light passes, and is conveyed by inner plates of glass fitted in the panels and segmental arches to the interior. Each plate has an ornamental register by which the temperature of the atmosphere within is regulated: there are also a large skylight and a

ventilator in the dome, and six ventilators under each gallery, through which impure air may pass that cannot find its way to the nave; all of which are under the control of the sexton at one place. The pulpit or chancel of this edifice is decidedly unlike that of any other yet erected in this country. Its prominent feature is that the chancel is formed of and on a stylobate of about 4 feet in height, on which stands an inner temple-like portico, rising to the full height of the entablature at the base of the ceiling. This temple, or portico, is ornamented with drapery, falling from behind the columns and pilasters, and separating about 6 feet from the tops of the columns, giving passage to a stream of light from an aperture above, during the day, and from gas-burners arranged, at night, in such a manner as to throw a halo around the speaker while in the position of addressing the audience. The gas-lights are applied on the abacus of the columns and pilasters, and so arranged as not to expose the burners or flame to the view, except at the most distant points. The entire edifice, when finished, will have cost between 50,000 and 60,000 dollars. The architect is Lefevre, of New York, and this edifice is about the fortieth church of which he has been the architect.

Large Hotel.—The Clarendon Hotel, New York, which is nearly completed, has a frontage of 175 feet: it is Elizabethan in style, and was designed by Mr. Renwick. It has fifty suites of rooms fitted up with baths and closets.

American Excuse for an Eclipse.—Little Boy—What's the use of an eclipse? Astronomer—Oh, I don't know! It gives the sun time for reflection.

Free Library for Apprentices.—There is a library in New York where books are lent to all mechanics' apprentices free of charge, on furnishing a guarantee for their careful use and safe return; and all are cordially invited to avail themselves of this means of improvement during the period of their apprenticeship. Journeymen mechanics, and others, may obtain the use of books from the library on payment of one dollar per annum.

One result of such arrangements.—At a recent convention for the Advancement of Science, "Mr. Patterson, of Albany, a journeyman printer, who recently published a work entitled the 'Calculus of Operations,' the object of which is to generalize, render more exact—taking all circumstances into account—and to harmonise the different branches and applications of mathematics, read a paper on the relation between the square roots of negative quantities, called imaginary quantities in algebra, and perpendicularity in geometry."

American Architecture.—A writer in the *Home Journal*, speaking of the rapidity with which new quarters are erected, says,—"Still, if I might be permitted a word of advice to the princely proprietors, I would suggest that they should consult a little more the laws and requisitions of architecture and taste in deciding upon the external appearance of their edifices, and treat us to somewhat fewer monstrosities in freestone than now offend the eye of the connoisseur. Objects of artistic beauty, erected by the liberality and taste of private enterprise, are public possessions of the most precious description, and exercise an incalculably beneficial influence upon the refinement and the morals of the community at large. In the immense architectural expenditure everywhere going on around us in this miraculous island, one is too often compelled to lament the absence of true taste, and the just appreciation of the beautiful. In fact, I know of nothing of which we stand more in need than correct ideas respecting domestic architecture. So far as convenience is concerned, perfection has nearly been reached; but in regard to the beautiful, we are still far, far behind even the Egyptians."

American Sculpture.—Mr. Crawford, an American sculptor in Rome, has in progress a colossal group of Washington and six of his contemporaries, which has been ordered by the State of Virginia. It consists of an equestrian statue of Washington upon a pedestal something like that of the Marcus Aurelius on the Campidoglio, which itself surmounts a star-shaped base, arranged in steps. At the six angles of this base, will stand statues of six eminent Virginia heroes of the era of independence: The entire height of the whole composition will be 60 feet from the ground; the architectural structure being 42 feet, and the equestrian group surrounding it, 18 feet. Each statue at the angles will be 11 feet in height, or, with the base on which it stands, 12 feet. The whole work, when modelled, will be cast in bronze at Munich.

NOTES IN THE PROVINCES.

Dorchester.—The inhabitants of Dorchester have had a public meeting, at which it was resolved to take measures for the establishment of a general cemetery within the borough under the provisions of the Health of Towns Act.

Brynford, Holywell.—It is intended to lay the foundation-stone of the New Church at Brynford, parish of Holywell, on 29th or 30th instant. This is one of the two churches to be erected in this and the adjoining parish of Whitford, in lieu of the one alienated by Lord Fielding to the Romanists. The foundation-stone of the second church, which is to be in the parish of Whitford, will also, we understand, be laid very shortly.

Tatworth, Chard.—On Tuesday week the new Church at Tatworth, parish of Chard, built for the accommodation of a district comprising the hamlets of Tatworth, South-Chard, &c. was consecrated by the Bishop of Jamaica. The entire cost of the church (including the expenses of consecration), will amount to about 1,400*l.*, nearly 150*l.* of which is still unprovided for. The building is in the Early English style. Mr. Pinch, of Bath, was the architect, and Mr. Davis, of Langport, the builder.

Exeter.—The gas movement is at present engaging the attention of the citizens of Exeter. At a recent meeting, it was resolved to form an "Exeter Cannel Coal Gas Consumers' Company." The prospectus proposes that the committee divide their profits with their consumers, supply gas at 4s. 6d. per 1,000 cubic feet, insist on payments for laying service pipe, or for reconnecting pipes which may have been cut off in changing the supply of gas, and make no charge for the use of meters. The present company have taken alarm, and have just announced their intention forthwith to reduce the price of their gas to 5s., and to supply meters free of charge. The company remind consumers that, since 1839, "they have voluntarily made six several reductions in the price of gas, in the aggregate from 9s. 6d. to 6s. per 1,000 cubic feet," and they admit that notwithstanding all these successive reductions, "their dividend, including bonus on their capital during the same time, has averaged 9*l.* 2s. 8d. per cent. per annum." The directors add that they are still prepared "to give the public the full benefit that may hereafter arise from strict economy, increased consumption, or improved modes of manufacture, being determined to sell gas on as good terms as any other company that can be established in the city."

Bridgewater.—On 10th inst., the new burial ground situate at Wembdon, for the borough and parish of Bridgewater, was consecrated. The chapel is a small edifice in the Decorated style, with a lodge attached to it, and was designed by Mr. W. Brakspear, the architect of the restoration of St. Mary's Church. Mr. Abraham Squibbs was the builder.

Totnes.—Lord Seymour some time since purchased the Gate-house, in the High-street, Totnes, and at a cost of about 1,000*l.* presented it to the townsmen, fitly furnished for a mechanics' institute, library, and reading-room. The principal residents of all parties and sects acknowledged the gift, by a public dinner lately to Lord Seymour.

Devonport.—A correspondence has been commenced with the Board of Ordnance with the view of obtaining for use as a public park some of the Ordnance land adjoining the town of Devonport.

Cardiff and Merthyr.—The church of St. John is closed for repair and alteration. The process of repewing is in progress. The pews are to be remodelled and additional accommodation afforded. The exterior of the building is also to be renovated.

North Malvern.—Trinity Church here was consecrated on Tuesday week. It is designed to accommodate 600 adults in open or free seats, and consists of a nave, side aisles, chancel, organ chamber, sacristy, and bell-turret, having a north and south entrance and porch. The nave is elevated, and flanked on either side with stone arches and columns, trefoiled windows piercing the clerestory over each. The side aisles have sloping lean-to roofs, with coupled windows. The organ chamber completes the north aisle, having stone arches and oak screens between it and the chancel. The chancel is fitted up with oak seats, open and plain, oak altar-rails, and stone reredos, and the east window is filled with stained glass, by O'Connor. The style is Transitional. From the very sloping site on which it is erected, the foundations at the east end are 15 feet below the present ground-line, which is at least 10 feet below the floor-line of the church, thus giving great elevation to the chancel. Mr. Daukes was the architect. The total cost of the building, &c., according to our authority, the *Hereford Times*, will be 3,500*l.* Lady Emily Foley gave the site and an endowment of 1,000*l.*

Chipping Sodbury.—The foundation-stone of the National Schools, now erecting in this town was laid on the 12th inst. by the lord of the manor, Mr. W. H. H. Hartley, supported by Sir W. and Lady Codrington, and the leading clergy and laity of the neighbourhood. The buildings comprise a large room to contain 160 children of both sexes, and a master's residence, and are being built in the Tudor style, under the superintendence of Mr. Thomas Watts, of Winterbourn, architect.

Birmingham.—The suburban district about Aston Hall appears to be at length about to be absorbed in the growth of the town of Birmingham, advertisements now announcing the intention to appropriate it as building sites. There is a desire expressed to preserve the hall itself to some useful purpose connected with town requirements.

Gailey, Penkridge.—On Thursday week the Bishop of Lichfield consecrated a chapel called Christ Church, at Gailey, Penkridge. This chapel makes the fourth chapelry in this parish. It is in the Early English style, cruciform, with a porch and belfry. There are 180 sittings on the ground floor, and a gallery at the west end (which is said to interfere sadly with the view of the west window) contains forty more, all open. The edifice has been raised by the contributions of the neighbourhood, and by grants from the Incorporated and Diocesan Societies. The site was given by Lord Hatherton, who has likewise given a site for a parsonage, and granted a rent-charge of 30*l.* per annum for the incumbent.

Bilston.—It is in contemplation to provide this densely-populated town with suitable baths and reading-rooms. A scheme has been set on foot to raise a capital for the purpose by shares of five shillings each, upwards of 5,000 of which have already been taken.

West Bromwich.—The new police station and petty sessions room here is now completed. The building is of brick, with a stone facing at the basement of the principal entrance. The centre of the building, on the ground floor, contains four offices, one for the use of the chief superintendent, one for the magistrates' clerks, another for the constables, and a fourth to be used as a store-room. These rooms are approached by the main entrance to the public business department, and immediately over them is the court-room, 40 feet by 26 feet, lighted from the front and rear. Adjoining this is an ante-room, and further on, into the western wing of the building, is a retiring-chamber for the magistrates. The cells are six in number, three being on the ground floor and three above. They are ventilated, and warmed with hot air. The front of the east wing contains apartments for the resident sub-inspector, while at the rear are placed living-rooms and dormitories for the constables. A

coach-house and stabling for four horses are also provided. The design was furnished by Mr. Smith, late county surveyor, and carried out by his successor, Mr. Trubshaw. The building was erected by Mr. Hartland, builder, and superintended by Mr. G. B. Nicholls, architect, both of West Bromwich.

Liverpool.—The Water Committee on Tuesday week, at a special meeting of the Town Council, presented their report on the tenders received for the construction of reservoirs and works. The report was to the effect,—"That, in accordance with the advertisement issued, twenty tenders have been received for the execution of the Waterworks, comprising the Rake and Roddlesworth reservoirs, the Anglezarke reservoir, and the Rivington reservoir, with the various works connected therewith. These works are divided into three portions, distinguished as contracts Nos. 3, 4, and 5, and are separately tendered for. After mature and anxious consideration of the various tenders, your committee recommend that the tender of Mr. John Isherwood, for the contract No. 3, at the sum of 20,806*l.* 4s. 6d.; and the tender of Messrs. Miller and Lawton, for the contract No. 4, at the sum of 22,350*l.* 19s. 9d.; and the tender of Messrs. Scott and Newell, at the sum of 56,252*l.* 8s. 8d. for the contract No. 5, be accepted, and the necessary contracts prepared and sealed." The amounts are considerably below the estimates of the engineer. The Act applied for by the Council, after the reception of Mr. Robert Stephenson's report, makes it imperative on the Council to purchase all the land required for the works within two years from the passing of the Act, which limit of time will expire on 29th July next. The report of the committee was adopted by a majority of 5, 26 having voted for, and 21 against it.—*Bolton Chronicle.*

Wisbech.—On Wednesday, in last week, the foundation-stone of the new Public Hall was laid by the Mayor. In a record, placed under the stone, it was stated that "the hall and buildings connected therewith were erected by shares, donations, and contributions, for the general use and accommodation of the Temperance Societies, Mechanics' Institute, and all other useful purposes, especially having regard to the social, mental, and moral improvement of the people, for whose more immediate benefit they are intended."

Holbeach.—The poor law guardians here proposing to erect an infirmary, appointed a committee with instructions to proceed on a builder's plan selected by the board, and the committee have just reported that, after some preliminary procedure, they "proceeded to stake out the site of the proposed building, and gave directions to Mr. Gilder, the builder, whose plan had been selected by your board, to make another plan, embodying the proposed alterations, and to submit it to your committee on the Monday following, accompanied by an estimate of the extra cost. That such amended and enlarged plan was submitted to your committee on the Monday, and of which they unanimously approve, but on account of the extra cost, amounting to no less a sum than 163*l.*, and which did not even include a boarded floor for the male and female wards on the ground floor, and which is considered absolutely necessary, your committee did not feel justified in proceeding further without first asking for instructions from your board. That, on closely inspecting the plan selected by your board, it appeared, in the first instance, that the rooms were not sufficiently lofty, that neither bath nor receiving-rooms were provided, that a wash-house (so essential an adjunct to an infirmary) was also wanting, and that the building itself was not provided with spouting, nor was the drainage taken into consideration. That your committee are unanimously of opinion that to build an infirmary, which in the end would not answer the purposes intended, would only be an entire waste of public money; and that, in the erection of all works of a permanent nature, a given sum is not so much to be looked at as an efficient building." The committee therefore asked, and were granted the necessary powers to carry out an extended plan.

RAILWAY JOTTINGS.

AN alarming fire broke out at the Eastern Counties Railway station on 18th inst., in the premises and arches occupied by a mahogany and deal merchant, whose stock was burnt, some of the arches injured, and the electric telegraph destroyed. Some other adjoining premises were also burnt.——The Victoria Station, at Sheffield, for the Manchester, Sheffield, and Lincolnshire, the Great Northern, and the Midland South traffic, was to be opened on Monday week. It occupies the space from the Wicker viaduct to the canal, crossing the river, the site of the Old Blonk Dam, the cattle market and fair ground, and the back of Sheaf Works. It is built on arches, rising 40 feet above the level of the Wicker. The station fronts south-west, having for its more prominent objects the Corn Exchange, the New Market, the canal warehouses, the Circus, &c. Its front is destitute of ornament, being very simple in its architectural character. The building is approached from Blonk-street by a straight incline, built upon arches, which is 50 feet wide, 320 yards long, and rises at the rate of 1 in 30. As it approaches the front of the station it opens out into an extended area. The station consists of a centre and wings, the latter being extended by a high fence wall, with gateways for the exit of arrived passengers, and beyond these, on each side, by covered stands for cabs. The length of the frontage of masonry is 400 feet. The station is built of rock-faced Greenmoor stone, with chiselled beds and joints, and facings of ashlar stone from Wadsley. A covered verandah, with glazed roof supported by iron brackets, extends the whole length of the centre building, in order that carriages may set down passengers under cover. The entrance or waiting hall is 50 feet by 30 feet, and 25 feet high, having an enclosed office for the booking clerks. The upper floor will contain board-room and other convenient offices. The platform is covered by a light roof of iron and glass of the width of 83 feet, and of the length of 400 feet. This roof is the work of Messrs. Fox, Henderson, and Co. It is ridge and furrow, with wooden gutters. The centre throughout its length is raised so as to permit a line of ventilation. The roof is not sustained by any pillars, but its principals, 25 feet apart, rest on the inner wall of the station buildings on one side, and on an equally lofty wall on the other side. The glass is crown, about the thickness of ordinary pottery. Its area is of the measurement of 34,600 superficial square feet. The platform is of the breadth of 40 feet, and is about 1,000 feet in length. The water that will be collected by the roof will be made available for the water-closets and urinals. The latter will be constructed of Minton's white encaustic tiles, and will be open to the roof. The station has been constructed under the direction of Mr. John Fowler, engineer-in-chief of the company, represented by Mr. King, the resident engineer; Messrs. Weightman, Hadfield, and Goldie, being the architects. The arches on which the station rests were built by Messrs. Miller, Blackie, and Shortridge. The approaches to the station, the platform, and the completion of the viaduct, are the work of Messrs. J. and A. Ridal; and the station has been erected by Mr. Carlisle, the builder of the Beighton viaduct and the new Market Hall.——Messrs. Peto and Betts, the contractors for the Oxford, Worcester, and Wolverhampton Railway, have issued a notice that they will not allow the sub-contractors on the line to carry on the truck system.——The Great Northern, instead of incurring an outlay in the shape of postages, it is said, has registered a newspaper in the stamp-office, called *The Great Northern Railway Company's Reporter*, and under this title, given in the smallest possible type, it issues all its documents, these passing through the post, whatever be their bulk, as a newspaper privileged by the penny stamp.——Mr. R. S. Norris, of Warrington, has patented some improvements in the construction of permanent ways of railways, bridges, locks, and other erections, wholly or in part constructed of metal; also an improvement in breaks of railway carriages. Mr. Norris's specification describes a method of casting or forming the chairs on the spot where they are permanently to remain. Moulds are placed on both sides of the rail, where the chairs are to be, and on the permanent iron, wood, stone, or other sleeper or bearer, and melted cast-iron is then poured into the moulds. For the purpose of casting, the patentee employs a portable and travelling cupola furnace, which is moved along the line of railway as the work of casting progresses. This mode of fastening is also proposed to be employed in other parts of railway works.——An important trial is likely, it is said, to come on in the Court of Exchequer during the next Term. In the Act of Parliament passed in 1845, compelling railways to carry passengers in third class covered carriages, certain exceptions were made, which were stated in the Act "to secure to the poorer classes of travellers a means of travelling at moderate fares, at or under one penny per mile." These were exempt from the Government tax. When the companies began to run excursion trains they looked upon this peculiar description of traffic as coming within the meaning of the Act, and did not include their excursion passengers in their return to Government: it did not amount even to one half-penny per mile. The Board of Inland Revenue, however, demand the whole amount of duty that would be payable on ordinary trains. The railway companies who have been running cheap trains have agreed to fight the battle with the Board of Inland Revenue, unless they forego their demand.

ANTIQUARIAN MATTERS.

Bridlington.—During recent excavations in a part of the churchyard at Bridlington, not used for interments, the workmen fell in with an old foundation, of great thickness, running in a line southward from the present south-east angle of the church, to an extent beyond the limit of the excavations. Another foundation stretching from it at right angles extended in an easterly direction. There were several fragments of shafts, capitals and mouldings,—the most interesting consisting of four highly sculptured stones, forming, when put together, the segment of one circle, and parts of two more. The design is a foliated scroll, the production evidently, it is said, of an artist, and not a mere ordinary workman. Fragments of two arches were also found. Close to the easternmost buttress the workmen came in contact with a foundation which appears to have been that of the western wall of the north transept, and, if so, it confirms the opinion that there has once been a north transept,—a subject on which archæologists have hitherto been much divided.

Taunton.—Alterations are now being made in an old house near the White Hart corner, which was originally the Guildhall of the town. A square mullioned window of the sixteenth century, cut out of a solid block of oak, has been discovered, and also some immense oak beams, which, says the local *Courier*, would, for size and durability, astonish many of our modern builders. Much of the interior decorations are still in good preservation, insomuch as to make evident that the house contained an abundance of carving, ornamented wood, plastered ceilings, and mantel-pieces. The "Justice Room" contains a notable ceiling, enriched with armorial bearings. The room is wainscotted with oak; and a portion of the original glazing appears in the longitudinal window. Tradition states that this room was the judgment seat of the infamous Jefferies, where he tried the "Taunton Men" who attached themselves to Monmouth. In the area fronting the house stood the ancient Market Cross (demolished in 1790), the site of Monmouth's short triumph when crowned and proclaimed King of England. Above the "Justice Room" are the remains of an open timber roof of a date coeval with the little oak window already noticed.—— An attempt, is about to be made to effect an entrance,—and to explore the subterranean cavern or passage which exists,—under the Castle and which by all accounts leads from the centre of the town to Bishops

Hull, a distance of more than a mile. Several attempts have been made to accomplish the same object on previous occasions, but without success, and the present one, we hear, is principally at the instigation, and will be under the direction, of the Somerset Archæological Society. An account of the passage will be found in "Savage's History of Taunton," and the use of it made about the time of the Monmouth rebellion.

Denton.—An antiquarian correspondent of the *Manchester Guardian* gives an interesting account of the old chapel at Denton chapelry in its impression of 10th inst. It is described as a very picturesque erection, built, he says, "in the half-timbered style, usually known as 'post and petrel,' or, as our cicerone termed it, 'raddle and daub,' which term he stated to be derived thus:—the frame-work of the chapel, said he, is composed of huge oaken beams placed deep in the earth: between each of these intermediate spaces, termed bays, there are numerous transverse beams: the interstices were originally filled with twisted boughs, &c., known hereabouts as 'raddlings:' this wicker-work was well plastered over with clay mortar (daub), which, to render it more adhesive, was well mixed with grass, hay, reeds, &c."

Clementhorpe, Yorkshire.—As some workmen were lately employed in making a sawpit in a field at Clementhorpe, they discovered a Roman pavement, in a fine state of preservation. The outer border is tesselated flooring of 8½ inches: the next portion is in black and white mosaic, of a half-moon pattern: within this is a richly-laced pattern in white, red, and drab, on a black ground. In the centre of the floor are geometrical figures, and at the corners the bell or tulip pattern. The eastern portion only has as yet been uncovered.

Glasgow.—Among other objects of curiosity discovered during the demolition of the old bridge of Glasgow is a key, found in the foundations of one of the centre buttresses. It is about a foot long; the wards nine in number, and remarkably well cut; the ring at the opposite end perfect, and the whole specimen in excellent preservation, and very little corroded. It was lying under the ancient oak trees sawn longitudinally, and on which the buttresses rested. The section of the bridge under which this key lay, was the most ancient portion of the structure, so that this venerable memorial of the builders of Glasgow's first bridge cannot be less than five hundred years old. Another key was found under similar circumstances, in the foundations of the next buttress.

Kilkenny.—In a house in a street leading from the Black Abbey to Friar's Bridge, built on a portion of the ancient cemetery of the Dominicans, and beneath a clay floor, according to the *Kilkenny Moderator*, there have been discovered three tombs of Kilkenny marble, fashioned into sepulchral monuments, with sculptured figures, and evidently of so early a date as the latter end of 13th century. One of them has an inscription which sets forth in the old incised Lombardic characters, and in Norman-French, that "Mester Roberd de Sardeloue" was there interred: there is, however, no date. "Sardeloue," it is thought, may, perhaps, have been the original form of the name of the ancient manor and castle of Ardaloe, in this district. The local Archæological Society will no doubt investigate the matter. The monuments, fortunately, will be carefully preserved within the precincts of the Black Abbey, and there are rumours of the probability of fresh discoveries of the same kind being made.

FALL OF A THEATRE.—At Simla, as appears from a letter in the *Times*, the proscenium roof, the orchestra, &c., of the theatre fell in while a fancy ball was in progress, but, strange to say, killing no one but one little boy, although the slight premonitory symptoms of scenery giving way were misunderstood and neglected to the last moment. The building, it is said, had been knocked up for sale, and was very inefficient: one of the walls had sunk.

IRISH RAILWAY AND ARTISTIC INTELLIGENCE.

The unfinished works on the Great Southern and Western Railway are progressing: the ballasting has been perfected, with the exception of ten miles: the various buildings at the Cork terminus have been completed. A sum of 25,000*l.* is estimated as sufficient to finish the entire works. A sum of 12,318*l.* 2s. 11d. has been expended on works along the line for the last six months: 2,650*l.* was laid out in the county of Kildare and Queen's County in connection with some of the bridges carrying public roads over the railway.

The works on the Londonderry and Coleraine line are expected to be complete about November. A station is about to be erected at Newtown-limavady. The Boyne viaduct, fully described some time since in "THE BUILDER," is progressing: upwards of 400 men are employed. Between Newfoundwell and the road leading to Green-hills, a number of hands are engaged.

Sundry works are to be erected at the cavalry barracks, Longford; additions to the district military prison at the new barracks, Limerick; two wash-houses at the Fermoy, Tralee, and Kilkenny barracks; and one at the Richmond barracks, Dublin; all according to the plans of the commanding engineer of her Majesty's Board of Ordnance.

A new bridge is to be erected at Culleville, on the Dundalk and Enniskillen Railway, and proposals are invited for same according to the plans of the company's engineer, Mr. Thomas Bell.

A new Roman Catholic church is to be erected at Ardfert, county of Kerry, and the Earl of Listowel has subscribed 50*l.*

The sites for the Model School, and Agricultural Model Farm to be erected at Limerick, have been decided upon by the Commissioners of National Education. Mr. Darley is the architect.

The new (R. C.) church with a tower ("in imitation of the well-known round towers of Ireland") in connection therewith, and a large stone cross, to be erected to the memory of O'Connell, from a design furnished by Mr. Petrie, is composed of an oblong body or nave, and a chancel connected to same by an *arcus triumphalis*. The dimensions are as follows:—External length of nave, 45 feet; breadth, 30 feet; length of chancel, 17 feet; breadth, 20 feet; external height of nave, 45 feet; of chancel, 35 feet; height of lateral walls, 15 feet. The sides of the roof will form an isosceles triangle. At each angle of front is a plain flat buttress, and a flat band resting on same, and carried to the apex of gables, on which are placed as finials, crosses. A plinth surrounds the building. In west elevation is an entrance doorway, enriched with simple architrave, and having a cross within a circle placed above. The side walls of nave are perforated by two small semicircular-headed windows, and those of chancel have a single angular-headed window at each side, and a semicircular-headed one in east wall—all deeply splayed. The roof of nave is of semicircular form, and the chancel arch is 10 feet in width by 15 feet in height. The arch is formed of thirteen stones, typical of the Saviour and twelve apostles; and the chancel is entered by three steps, to represent the Trinity. In the chancel, raised on a platform, is an oblong square altar tomb. Above roof of nave is a second apartment divided by cross walls into three chambers. The building is to be of chiselled granite stone, in regular ashler courses. On the south side of church is placed the tower, at a distance of 15 feet: the external diameter is 15 feet; and its height, including conical roof, is 103 feet. The interior is divided by ledgments into six compartments, that at top having four apertures, and the lower ones one each. The doorway is placed at an elevation of 15 feet; is semicircular headed, with cross carved on key-stone; and the pinnacle of roof is ornamented with a cross. In front of entrance doorway, at a distance of 20 feet, is the stone cross of ancient character. It rests on a stone base 10 feet by 8 feet, and rises above platform to a height of 27 feet. It is of simple character.

HOUSES FOR THE WORKING CLASSES AT EDINBURGH.

ON Monday in last week the foundation stone of a block of improved dwellings for the working classes was laid in one of the closes of the High-street, Edinburgh, near John Knox's house, at Leith Wynd. The entrance is to be widened and improved. The first practical step has thus been taken by a new Association, set on foot about fifteen months since, and which now has a capital of about 5,000*l.*, subscribed in shares of 5*l.* each. The stone was laid by Mr. Cowan, M.P. The building is to be finished and ready for occupation by Whit Sunday next. It will afford accommodation, in all, for thirty-nine families, and is to be four stories in height, and in length about 126 feet, with the front in the direction of High-street. Light, air, drainage, and water-supply have all been specially provided for, they say: the cistern, which is to be of iron, and placed near the roof, will hold upwards of 2,000 gallons of water, or about 50 gallons for each family. Fire can scarcely be dreaded, as, with the exception of the doors and the joisting in only two of the apartments in each dwelling, there is no wood whatever about the entire building,—the external walls being of stone, as well as some of the floors, and the internal walls and partitions of brick. The brick, in all places where it is much exposed, is glazed on the surface, the edges being insulated, giving a sort of "rustic" appearance to the walls, the effect of which, our authority the *Scotsman* says, is rather pleasing. The walls of the stairs are built with these glazed bricks, and so are those of the sculleries, so that painting or white-washing is unnecessary. Each scullery is to be fitted with strong earthenware washing-tub and cast-iron stand, with pipes for clean water and dirty, cast-iron sink, dust-valve, coal-closet, &c.

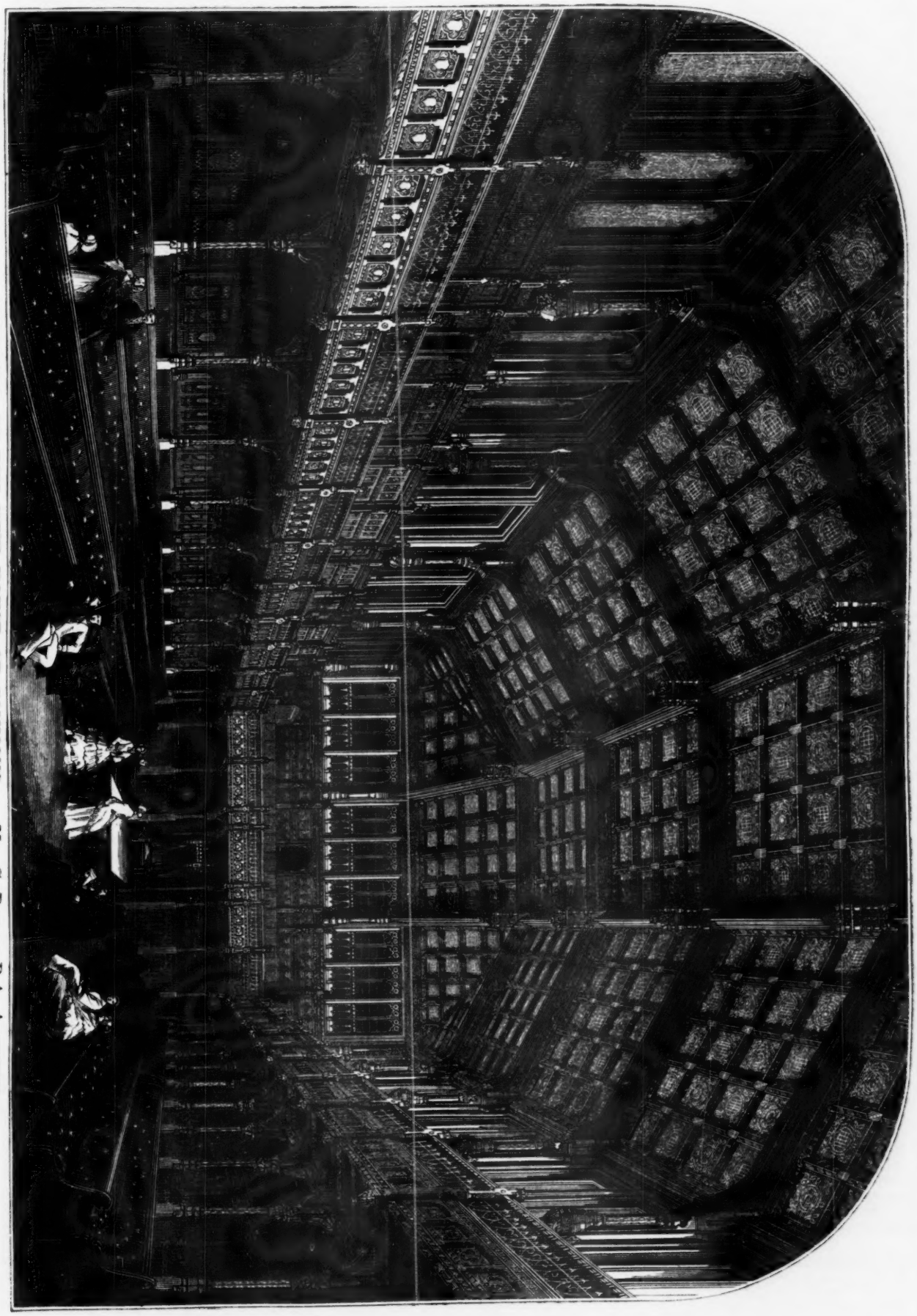
The dimensions of the kitchens are to be 14 by 9½ feet. The bed-rooms are to be the same; while the sculleries will be about 5 feet square. The height of the roof, in each instance, will be 9 feet 3 inches. The estimated expense of each building is 90*l.* or about 3,500*l.* for the whole; and it is intended to let each dwelling-house at a rent of 6*l.* 10s. per annum, which will yield a return on the outlay of about 7 per cent. The contractors for the building are Messrs. W. Beattie and Sons; and the architect is Mr. George Beattie, one of the partners of that firm. A block of the same sort of buildings has already been for some time in progress in the Pleasance, by the enterprise of one of the citizens (Mr. Patrick Ritchie, machinist) under the same builders. His example is also to be followed in Beaumont-place, by Colonel Forbes, who intends to erect a house with accommodation upon a larger scale than that afforded either in the properties in course of completion by Mr. Ritchie, or those to be erected by the Association.

THE NEW HOUSE OF COMMONS.

WE have so recently (vide p. 460) given an account of the interior of the new House of Commons, and the alterations made on its previous appearance, that in giving a view of it as it now appears, the first and only view yet published, we need but refer to the description already given.

In our vol. viii., p. 7, is a view of the original appearance of the interior of the new house, from a comparison of which with the view now given, the nature and extent, as well as the general effect of the recent alterations, will be seen at a glance. The ceiling, it will be remarked, has been brought down 5 or 6 feet in the centre, and in place of being flat over the whole expanse, as before, is sloped down on all sides. The upper half of the windows, which formerly had a central transom, is thereby put out of sight, and as this lessened the light considerably, the cills have been cut down about a foot.

The gallery immediately above the Speaker's chair, as seen in our present view, is that for the reporters to the press. A gallery for ladies is formed behind the open stone-work seen immediately above the Reporters' gallery.



INTERIOR OF THE NEW HOUSE OF COMMONS.—Mr. C. Barry, R.A. Architect.

THE SOMERSETSHIRE ARCHÆOLOGICAL SOCIETY.

THIS society held a very successful meeting at Weston-super-Mare, the High Sheriff of the county in the chair.

Mr. Giles, one of the hon. secretaries, read a report from the committee, which showed that the number of members enrolled is 339. It appears that the society have published a volume of transactions, containing the papers read during the last two years. Mr. Freeman read a paper "On the Perpendicular Churches of Somerset."

A paper on the Abbey Church of Bath, by Mr. C. E. Davis, was afterwards read. Mr. Davis remarked that many accounts had been written of the abbey, all of them speaking in the highest terms of the beauty of its design, but agreeing also in the faultiness of the details and the clumsiness of the work. He looked on the building, however, in a different light. He did not consider it as an example of the perpendicular, but as the herald of a new style. At the beginning of the sixteenth century, about which time the abbey was designed, the literature and art of other nations were very generally studied in England, and the traveller came home with a growing admiration of the monuments of Rome. In the design of the Bath Abbey it was evident that the architect was alive to the follies of the day, and endeavoured to avoid them. His aim was to avoid the perpendicular lines and the angles then so much praised; and the appearance of poverty in the building was the result, not of that design, but of the smallness of his funds. The arches of the nave and choir were elegant without extreme lightness; and beauty, not monotony, was the result. The roof appeared to derive support from invisible means, and was a model of grace, elegance, and lightness. (?) The merit of the design of the church could not be doubted: the cleverness of its construction had always been allowed; and he was at a loss to see why rudeness of workmanship should be imputed to it. It was the commencement of a new style, and, having the building before them, all united in praising its general effect.

The Rev. M. Clerk questioned some statements made by Professor Willis in his lecture on Wells Cathedral, at the recent meeting of the Archæological Institute. Mr. Willis had distinctly said that the west front could not have been built by Jocelyn Trotman. He (Mr. M. Clerk) had great satisfaction, however, in knowing that Mr. Cockerell agreed with him in holding that the west front must be included among Bishop Jocelyn's works. It was certain that the style was of no later date than any other portion of the building; and all the ancient writers were agreed that the west part was the very part which Jocelyn did build. The Canon of Wells plainly stated that he pulled down the previous structure to the very pavement, and re-erected and then dedicated it. Godwin stated that especially that portion west of the presbytery was completely rebuilt by Jocelyn. The date of the consecration was given in Jocelyn's own words, for he said that he consecrated it on the day of St. Romanus, in the month of November, in the year of our Lord 1239. In another document, bearing date the very year of Jocelyn's death, 1342, and in the thirty-seventh of his episcopate, he spoke as if the church were completely finished: "Which, when we came into possession of" (referring to the bishopric), "our Lord and Saviour promising assistance, having called on him for it, we have fitted it for Divine prayer, sacred unction, and every thing necessary for the right performance of Divine service. And since it is right that those who build churches should also care for those who minister in them, we give" so and so, to the persons who are to serve them. These words were in favour of his (Mr. Clerk's) theory. It was finished after the consecration deed. Professor Willis said, he (Mr. Clerk) had not seen that deed, but he thought that Jocelyn would not have stopped building in the last years of his life, when there was a possibility of his completing the structure before his death. The only person who appeared to have contributed to the building besides Jocelyn might be ascertained by an inscription which appears on the third abutment of the front of the cathedral, with a date about that of Jocelyn's time. Another date on which he and Professor Willis differed was the date of the central tower. He (Mr. Clerk) put it above 1366: Professor Willis made it 1321. His (Mr. Clerk's) reason for believing that the latter date was correct was, that in every case the spandrils of the arches were marked as in perpendicular work, and that there was a regular band of panels, peculiarities which had not, as far as he was aware, been seen at an earlier date. He believed it was about the time when the perpendicular was merging into the decorative. The documents to which Mr. Willis referred certainly spoke of the convocation in 1299 and 1318, and the gift from Taunton Deanery in 1321; but he (Mr. Clerk) believed that there was another portion of the tower added then, but not that which is now visible: the old work was cut away, and the new framed into it. The corners of the tower have perpendicular mouldings, about the date, no doubt, which Mr. Willis assigned to them; but the whole of the windows had inserted into them tracery of a much later date, according to his opinion.

Amongst the other communications, the Rev. F. Warre read a paper on the British Camp on Worle Hill. An excursion was made to Kewstoke and Banwell Church.

GREENWICH BATHS AND WASHHOUSES.

DESIGNS for this establishment were received in competition, in April last, as our readers may remember. The selected design has since been carried out, and the building is now occupied. It stands in London-street, near the railway station (at the corner of Royal-hill), has a Jacobean front, of red bricks, with free-stone dressings and porch. The engine shaft presents a spiral of various-coloured bricks. Although somewhat confined, the accommodation within seems considerable, and includes forty-two baths, first and second class plunging baths, and washing department. The roofs are of iron, light in construction: the centre portion of the roofs is glazed, and is raised up so as to admit a range of upright louvred openings on each side. The baths are of earthenware: the partitions and floors slate. The first class plunging bath is lined with Orsi and Armani's lava, of a blue colour, which gives great brilliancy and greenness to the water. The second class bath is being lined with the same material, of a red colour, and will probably not be so pleasant in effect. Mr. Ritchie was the architect; Mr. Burton the builder.

The sum to which the competitors were confined was 5,000*l*. We said, when we noticed the various plans submitted, that the selected design would obviously cost more than the prescribed amount, and so it has turned out; no less a sum, as we are told, than very nearly 10,000*l*. (including the land), having been expended on it. So much for justice in architectural competitions.

WINDSOR.

A NEW surveyor has been appointed by the local Board of Health here; also an inspector of nuisances, whose salary, offered to the superintendent of police, and amounting to 20*l*. a year, has been taken from the surveyor's, making the latter 80*l*. a year. The candidates for the surveyorship were,—Mr. Edward Corfield, of Brighton, formerly in the employ of Mr. Bedborough, of Windsor; Lieutenant T. Smith, of London, formerly of the St. Helena regiment, and superintendent of works in that island; Mr. George Southwood, of Windsor; Mr. Jesse Hollis, of Windsor, who offered to perform the duties of surveyor and inspector for 80*l*. a year; Mr. Samuel Henry Webber, surveyor and inspector to the Eton local Board of Health; Mr. Thomas Jenkins, surveyor, of Windsor; Mr. Frederick Brown, of Windsor, lately acting as assistant-surveyor. The testimonials of the different candidates having been read at a meeting on Monday last, the committee divided, when there appeared—for Mr. Jenkins, eight; for Mr. Brown five; Majority for Mr. Jenkins, three. Mr. Jenkins agreed to accept the office on the terms offered.——At same meeting a letter from the Commissioners of Woods, &c., to Mr. Voules, on the part of the Board of Health, was read, in reply to a request by the Board that the Commissioners of Woods would sanction two or three little improvements in the Home Park, such as that a pump, and an iron seat, lately put up for the occasion of the cattle show, should be allowed to remain for behoof of the public. In reply, the commissioners state that they will consider the subject, but "that they cannot delegate to the Windsor Board of Health any of the duties with which, as Commissioners of her Majesty's Woods, &c. they are invested, for the management of the royal parks, or for the protection of the public interests therein."——A prospectus, we observe, has been issued for the improvement of Windsor, by new streets, a square opposite the new church, new almshouses, villas, slaughter-houses, burial-ground, lodging-houses, washing-houses, and cottages for the poor, &c.; also for the demolition of unsightly buildings, and the erection of a large reservoir behind the Guildhall, for water supply and drainage. No hasty speculation, it is said, is intended, but merely the preparation of plans for future guidance.

SCHOOLS FOR WORKMEN.

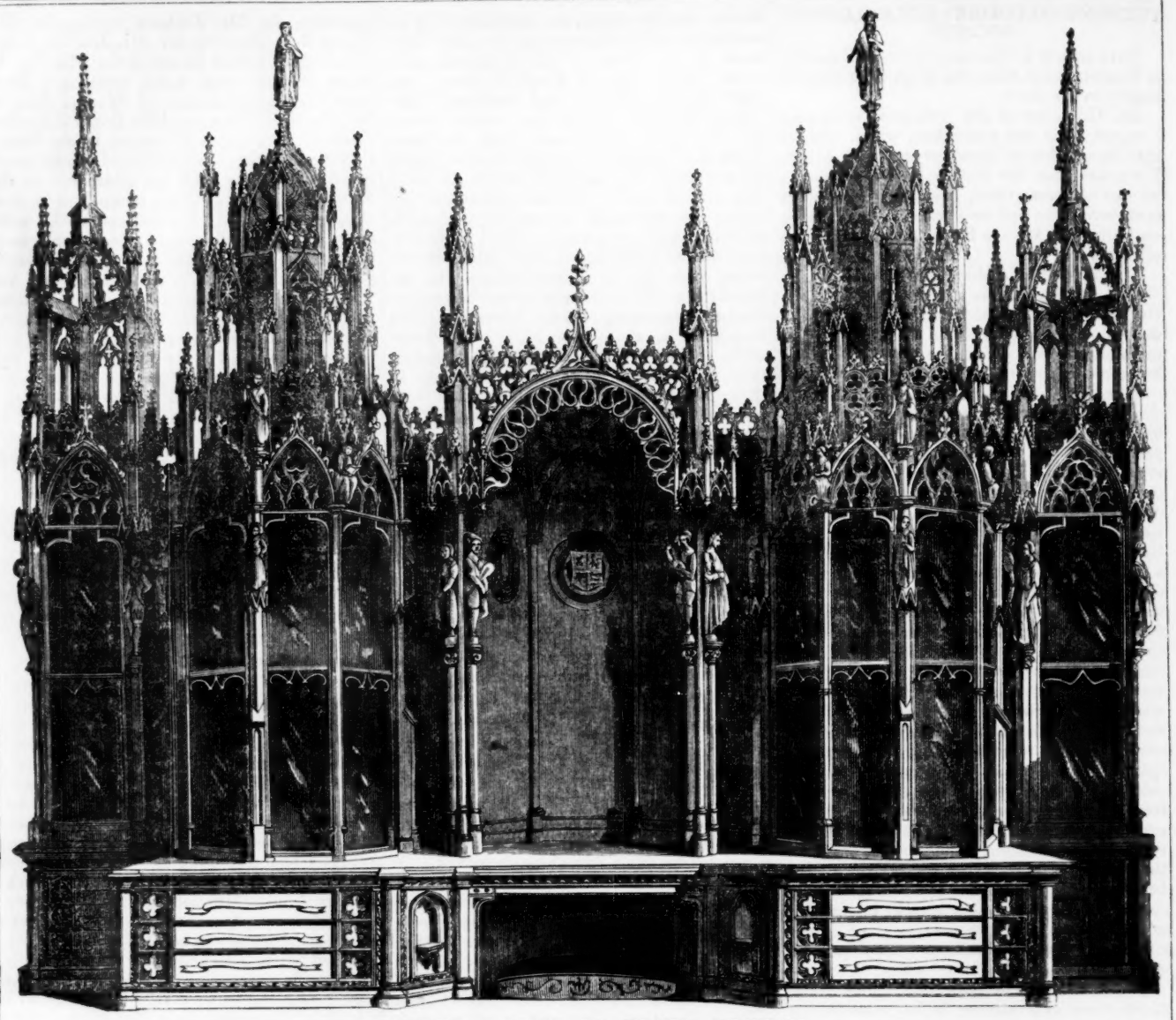
IT must be a matter of satisfaction to all interested in the progress of artisan art education to find the subject so frequently adverted to in your columns. In the present day much is done by continual discussion. When many brains are working on one subject, some good will certainly be educed. The proposal advocated by Mr. Allen has its own peculiarities; but I trust you will allow me to point out that his school would *not* be "the first school of art established to improve art workmanship." In May of last year, as your readers know, a committee of gentlemen who felt deeply the importance of this subject, determined to establish suburban artisan schools, and their first school was opened in Camden-town, under the name of the North London School of Drawing and Modelling. This school may be said to be successful, as it has been well attended. It is strictly a school for the art education of the workmen, and not in any degree a school of design. It appears to many that the system adopted here is superior in its nature to that now advocated. The workmen are led to know and understand the true form of objects which they will have to execute; and a capability of drawing the forms of objects, enables them more excellently to execute such forms when they meet with them in the drawings of designers. By the proposed new plan the workmen are treated more as machines which it is desired to improve than as men of thought and understanding, who simply require *knowledge* to enable them to perform their mechanical works with more perfection.

I do not understand the advantage of only instructing builders' men. It is true architecture is a leading art, but architects of high standing do not despise the work of designing frames, fenders, and arm-chairs. Indeed, true architecture should include the interior ornaments, and furnishing of a house as well as building the case, and without the carver, moulder, and upholsterer's workmen, the architect's work would be deficient. Indeed it is through these inferior applications that the public mind can chiefly be instructed, and the beauties of true art have thus at last a fair chance of a full development in its higher and nobler branches.

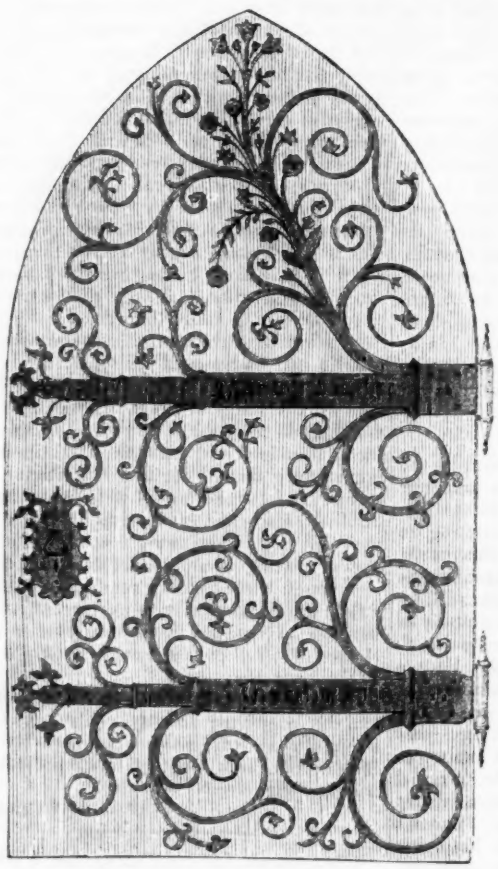
Let artisan art-education be for all comers, and be supported actively, and not only passively, by all who possess opportunity (and their number is legion) of advancing the happiness and pleasures of mankind.

J. NEVILLE WARREN.

The contract for completing the works on the Killarney Junction Railway has been taken by Mr. Dangan, but the works do not commence until February 1852.



CARVED BOOKCASE FROM AUSTRIA.



IRON WORK FOR CHURCH DOOR, FROM DERBY.

TERRA COTTA FONT, FROM SWITZERLAND.

THE ILLUSTRATED ART-JOURNAL CATALOGUE.*

THE completed catalogue of the Great Exhibition issued by the proprietors of the *Art-Journal* is now before us, and forms a truly extraordinary volume, creditable not only to editor, writers, draughtsmen, engravers, printers, and all concerned in its production, but to the country. Every one of about 400 pages is filled with illustrations: if we said, on a rough calculation, that there are nearly 3,000 of them, we should probably not be far from right, and those who know the trouble and expense attending the production of such engravings will best estimate the way in which this work has been carried through. The cost must, indeed, have been enormous, and but for the connection of the catalogue with an established journal, it could scarcely have been published at such a price as would have secured a sufficient sale.

Of course it is not without faults, the most prominent of which, as it seems to us, is the want of any means of judging of the *real size* of the objects represented, but of these we intend to say nothing.

The catalogue is preceded by an able, succinct history of the project and of the building, illustrated with views of the interior and exterior; and then at the end of the volume there are essays "on the Science of the Exhibition," by Mr. Hunt; "on the Vegetable Kingdom," as exemplified by it, by Professor Forbes; "on the Harmony of Colours," by Mrs. Merrifield; "on the Machinery of the Exhibition," by Professor Gordon; and the prize essay, "The Exhibition as a Lesson in Taste," by Mr. Wornum.

The engravings were executed under the superintendence of Messrs. Dalziel. Mr. W. H. Rogers designed the head and tail pieces.

And why may we not name and give praise to the able and excellent editor, Mr. Samuel Carter Hall, by whom the whole was struck out and superintended. As editor of the *Art-Journal*, Mr. Hall laboured hard for many years with more advantage to the public than himself. But he has now achieved for his journal the pecuniary success which such labours deserve, and earnestly and sincerely we congratulate him upon it.

The examples we give of the illustrations in the Catalogue represent—1. The Gothic Bookcase, carved in oak, presented by the Emperor of Austria to the Queen of England. This was designed by M. Bernadis and executed by Messrs. Leistler and Son. 2. A clever terra-cotta Font, from Switzerland, by J. Ziegler Pellis, of Zurich; and 3. Iron work for the Door of a Church, by Mr. W. Haslam, of Derby.

ENRICHED GOTHIC MOULDINGS.

IN a paper published in your journal (p. 511, *ante*), Mr. Little attempts to establish as a "*principle*" *that was in no case departed from* by the architects of the Middle Ages, that the contour of their mouldings was "never" disturbed by sculptured enrichment.

This opinion has occurred to many architects; but, on a more extended observation, has been discarded, as certainly not of universal, although it must be acknowledged of very general application. I send you a tracing of the necking mould, of a finial from the sedilia of Exeter Cathedral, which, as you well know, is of excellent design and workmanship; also a tracing of a flat ogee mould surrounding a monument in the Lady Chapel of the same cathedral, and closely resembling in arrangement the Roman water-leaf, with a difference only in the adoption of the well-known and characteristic leaf of the period.

I am very unwilling to believe that these are solitary instances in which what Mr. Little conceives to be a "principle" has been disregarded by the Middle-age architects; but they are the only examples that I can now recollect having met with. The enriched necking mould I send is almost universally used in Exeter Cathedral, and the design varies in almost every case.

I think these justify my remarks, and refute Mr. Little's statement to the effect that for a period of nearly 400 years this system was so entirely set aside that *no instance can be produced of the slightest approach to the classic system.*

Such questions are useful, and should by all means be raised: I therefore trust these remarks will be received as kindly meant.

W. H. B.

Books.

Catalogue of the Museum of Mediæval Art collected by the late L. N. Cottingham, F.S.A., Architect.

IT is to be regretted that the application made to Government to purchase this valuable collection has failed, and that it is but too likely to be taken to pieces under the hammer of the auctioneers, Messrs. Foster having already advertised its sale on 3rd November and fifteen days subsequent. If so, however, it is to be hoped at least that a selection of models, as examples for workmen, will be procured for the Artisans' Work-Schools, set a-going by recent communications in our columns.

The World in its Workshops: a practical Examination of British and Foreign Processes of Manufacture; with a Critical Comparison of the Fabrics, Machinery, and Works of Art contained in the Great Exhibition. By JAMES WARD. Orr and Co., Paternoster-row.

WE are glad to see that this little volume, one of the best of those published on the International Exhibition, has run through its first edition, and that there is a demand for a second. Having already reviewed it favourably, we need only now recommend it again as a pleasant discourse on an inexhaustible subject. By way of contrast, however, to the apparently disparaging remarks lately made by some one or other of our own writers in THE BUILDER, on theoretical men as contrasted with practical, we may quote the following from the introduction:—

"'Do I mean to say that *practical* minds are not capable of availing themselves of the improvements they may see in the Exhibition?' I really do. Take the mass of what are called 'practical' minds, as a body they are nearly as inapt to appreciate and apply improvements as the mere loungers and idlers who saunter through the treasure-stored avenues of the building. They will look with perhaps a shrewder eye at the several objects upon the production of which they may have been partially engaged; but the result, in a majority of cases, will prove little more than a negative: they must wait for the thinking few to lead them, from whom all practical knowledge of a valuable nature is derived. These few are the stars that guide the many in the true path of improvement; but as yet they are below the horizon, gathering light, as it were, to shine steadily and clearly on the future course of their humbler 'practical' brethren."

Miscellanea.

FATAL ACCIDENT AT ST. GEORGE'S HALL, LIVERPOOL.—On Friday before last, the Rev. D. Wilkie died at the infirmary from injuries received by falling through a staircase opening at St. George's Hall. The unfortunate gentleman was viewing the building, when he saw an opening in the floor, and thinking that it was a staircase, he stepped with the intention of descending the stairs. It proved, however, to be merely an aperture, to which the stairs had not been attached. The deceased fell with great force into the lower floor, a height of about thirteen feet, and one of his legs was dreadfully fractured, which injury caused his death. The jury returned a verdict of accidental death, expressing an opinion that precautions should be taken to prevent accidents of a similar nature in future, and suggesting that a guide should be provided to conduct visitors through the building.

ENCROACHMENTS IN ST. PANCRAS.—A "District Surveyor," replying to our correspondent, "F. B. A.," says,—since the passing of the Act 7 Geo. 4, alluded to, the character of the property bordering on the New-road has become entirely changed; the houses for the purposes of private residences being all but valueless: the traffic being now enormously increasing, the old residents have taken wing to quieter locations: one-storied shops are being built for the purposes of trade, over these gardens, and the line of road bids fair to rival Oxford-street. There have been several actions under the Act above alluded to: the last one was compromised by the parties agreeing to set back the shops three feet to widen the footway: it was also doubtful whether an addition to a house could be brought under the term "erection of any building." The entire roadway and footways are now six feet wider than before, no *inconsiderable boon* to the public, and some little sacrifice on the part of the owners of property. As far as the Building Act is concerned, the Commissioners of Works and Building state these erections do not come within the scope of the Building Act. This has been for some time a *vexata quæstio* among the profession, many conceiving that they did. The writer further says, it may fairly be doubted whether they can be brought under the Act 7 Geo. 4; the road commissioners have waived any claim that they might have had under this imperfectly worded Act, by tacitly acquiescing in these erections for years past, and are not now in a position to enforce the Act, admitting the Act to be so construed as not to leave a question. Still he thinks the public have no great ground of complaint, as they are benefitted by the footways being each increased three feet in width.

THE PEAT BOGS IN IRELAND.—A new attempt to convert the Irish peat bogs to profitable account, has been made in the county of Kerry, by the Great Peat Working Company of Ireland. For some weeks past several hundred hands have been employed in preparing a supply of peat, and the first stone had been laid of a new station, in the vicinity of Cahirciveen, and within a short distance of the harbour of Valencia. This will be completed, and the necessary machinery be at work, in between two and three months. The object of this company is the preparation of compressed peat, charcoal, and tar. The first of these articles is obtained, it is said, of a density equal to that of pitcoal, and not inferior in any respect as fuel, while in some respects superior, and also more economical. It is prepared in blocks of any required size, the sides of which, from the great pressure to which the peat is subjected, are said to have all the appearance of a high polish, and may even be handled without soiling the most delicately-coloured glove. In the preparation of the charcoal the tar is economised and collected, for the preservation of timber; and for illumination, it is said, a superior gas may be obtained from it, at about one-half the cost of that prepared from pitcoal.

THE COLOSSEUM, REGENT'S PARK.—Looking in here the other evening we found the building crowded with visitors, nor can we wonder, for it is certainly a supereminently beautiful exhibition. Danson's fine picture of "Paris by Night," is an object of general interest to all the foreigners who visit London: its truth and deception are equally startling. Besides "Paris by Night," they have Parris in the morning, if we may be allowed a quibble; for the panorama of "London," by that artist, has been restored to its place, and forms an important feature of the exhibition.

EQUESTRIAN STATUE OF THE QUEEN IN GLASGOW.—At the Glasgow Town Council the sum of 500*l.* has been voted for an equestrian statue of the Queen, in commemoration of her Majesty's visit to the city in August, 1849. The private subscription towards the same object already exceeds 3,000*l.* and the work will be commenced forthwith. As division of opinion may exist regarding the choice of an artist, it has been suggested by some gentlemen that the nomination should be placed in the hands of Prince Albert.

* George Virtue, London.

BUILDING SPECULATIONS IN GLASGOW.—At a fortnightly meeting of the Dean of Guild Court, held on Thursday in week before last, new building operations were sanctioned, inferring an outlay, we have been informed, of not less than 50,000*l.* The local *Herald* fears a building mania. The operative masons are becoming restive under their rising prospects. At same court the Fiscal directed the particular attention of the court to a case in the Drygate, in which a proprietor had erected two tenements, about 30 feet square, connected by a brick staircase serving both houses, and in which it was proposed to accommodate fifty-three separate families in single apartments. Forty-eight of these tenants would enter by one door three feet wide, and forty of them would find access to their houses by a staircase, which at some of the turns was only two feet eight inches wide. The tenement was six stories in height, with attics, and the whole erection was of such a character as to put to shame any of the old overcrowded, ruinous fabrics which the court had been so anxious to banish from the dense parts of the city. The court determined to look into the matter. Meanwhile, observes the *Herald*, our modern cheap builders may take a look at the place, for none of them have yet thought of carrying up "shiver" partitions to a height of six stories. We learn that a considerable portion of the building materials were carted from an old wretched fabric which was very properly razed to the ground last year, by Mr. Robert Napier, of Lancefield, who removed it to get quit of the nuisance in the vicinity of his extensive works in Washington-street. The cost of the structure, we are informed, will be about 1,200*l.*; and it is expected that a rental of between 200*l.* and 250*l.* per annum will be received for it.

DISTRAINT FOR RENT.—At the County Court, Liverpool, on Wednesday in week before last, an action was brought to recover 9*l.* 6s. for overcharge made by defendant on a distress for rent in which he acted as bailiff. The judge decided that, according to the construction of the fifth section of the statute, the tenant was allowed five clear days to replevy goods or pay the rent, and that nothing more was necessary to be done by the bailiff than to take an inventory, and to secure the goods by keeping men in possession; that no appraisement was contemplated by the statute until the expiration of the five days, and that it was a duty cast upon the bailiff by law to seize a proper amount of goods; and for any assistance to obtain that he would have to pay himself, and he would be liable to an action only if he levied a considerable excess; that after the expiration of five days, he would be allowed a reasonable time for advertising and selling the goods, and therefore there was no necessity to advertise them for sale on the sixth or seventh day. The plaintiff, therefore, was entitled to recover, and he would allow the bailiff 1*l.* 1s. for levy, and 2*l.* 10s. for men in possession, which would leave a balance due to plaintiff of 8*l.* 16s., for which amount the verdict must be entered.

ELECTRO-TELEGRAPHIC PROGRESS.—On Tuesday last about twenty miles of the great submarine telegraphic cable had been shipped at Wapping to be transmitted to the Channel. We have already described this renewed endeavour to effect the telegraphic union of Britain and France. There are still doubts of the sufficiency of the means, and certainly a power of tenacity overcome by a force of 8 tons' weight is as nothing to forces which it *may* meet with in the great deep. That it is a decided improvement on the last, however, there can be no doubt. The last was a mere wire coated with gutta percha to a thickness like that of a small wax taper. We pointed out both then and previously the imprudence of trusting to gutta percha under such circumstances, and we now find elaborate precautions taken to protect that substance from the destroying agencies of the ocean. These are no more than necessary. We even find from the Berlin correspondence of the *Times* that the gutta percha which covers the Prussian telegraphs is constantly being destroyed by vermin, such as rats, although placed underground for comparative safety. Tar itself and flax are still vegetable substances, and may be acted on under the ocean—as timber is, for instance, by the *teredonavalis*—so as to be not very long a protection to the enclosed gutta percha even yet, any more than the galvanised iron wire, though that in ordinary circumstances certainly appears to be by no means so corruptible as iron naturally is. May it not become *de*galvanised in course of telegraphic use under the ocean? We, even yet, have not heard of adequate experimental test or inquiry having been gone into on these points. The present renewed experiment is rather a costly one, and of course it is desirable that the materials used should be as lasting and effective as well as strong as possible.

METROPOLITAN COMMISSION OF SEWERS.—A special general court was held last week, at which the Essex-street sewer question was postponed till next court-day, when plans would be perfected. The court then proceeded to open various tenders for works, and the character of the work previously performed by the different candidates was openly discussed. Sir J. Burgoyne felt it desirable that the claims of the different contractors should be discussed in private: the other commissioners concurred, and it was understood that all contracts would in future be privately considered. In answer to the application made by the inhabitants of Richmond, as to the amount necessary to complete the drainage of that town, in order that they might raise the sum at once, the engineer reported that 2,241 feet of sewer alongside the river, and 50,637 feet of piping were required. 2,900*l.* had already been expended, and the remainder required would be about 4,950*l.* Reports as to various other works were then considered and agreed to.

STRIKE AND PROSECUTION OF BOILER MAKERS.—About 150 men, in the employ of Messrs. Kitson, Hewitson, and Thompson, boiler and locomotive manufacturers, &c., Leeds, recently struck work through a dispute about wages, and still remain out, but the firm are making efforts for filling their places by non-society men. Several of these, boiler-makers by trade, were on Monday week engaged at Newcastle, by Mr. Hewitson, at 25s. per week, for twelve months: he paid their fare to Leeds next day, and they were to commence work on Wednesday morning. They, however, failed in doing so, and warrants were obtained against five of them. They were immediately arrested, in what was understood to be the Boiler-makers' Club-house, and brought before the sitting magistrates at the Court House. A conference, however, took place between the defendants and their employers, after which the former expressed their willingness to return to their work and fulfil their contract. The Mayor expressed a hope that the defendants would, like good Englishmen, fulfil the engagement into which they had entered, and that the workmen on strike would endeavour to bring the differences they had with their employers to a close. The defendants were then discharged out of custody, on entering into their own recognizances, in the sum of 20*l.*, to come up for judgment when called upon; the understanding being that if they fulfilled their engagement no further proceedings would be taken against them.

PAPIER MACHE.—Mr. Charles Frederick Bielefeld, of London, has enrolled a patent for improvements in the manufacture of sheets of papier mâché, or substances of the nature thereof. These improved processes are for the manufacture of pressed articles from pressured sheets instead of pulp, and for the production of such prepared sheets. The apparatus which the patentee uses in this manufacture consists of a table, having a rack on either side, by which it is traversed backwards and forwards under a roller, so supported as to give the required degree of pressure to the material, and at the same time capable of being varied in its elevation, in order to reduce or increase the amount of pressure; or it may be a weighted roller for the purpose. The material which the patentee prefers for the manufacture of sheets of papier mâché, suitable for panels for cabins of steam-vessels and other like purposes, is given in the following proportions:—Mix with thirty parts of flour eighty parts of water, thoroughly incorporating the flour, so as to reduce the mixture to the consistency of paste, adding, at the same time, nine parts of alum and one of copperas. With this paste is then mixed fifteen parts of resin, previously dissolved by heat, adding, also, ten parts of boiled linseed oil and one of litharge. These ingredients having been mixed in the above order, are then mixed with about sixty parts of rag-dust, which the patentee finds the most economical, but other matters may be used, such as paper-makers' half-stuff or pulp deprived of its moisture to such an extent as to be no longer fluid.

EFFECTS OF VENTILATION.—The following statement, from the history of the Dublin Lying-in Hospital, quoted by the *Advertiser*, is very striking. In the years 1782-3-4 and 5, of 7,650 infants, brought forth in the above hospital, 2,244 died within the first fortnight after birth, chiefly of convulsions, or what nurses called nine-days' fits. These children foamed at the mouth: the jaws became firmly closed: the face swelled and assumed a purplish hue, as though they were choking. This last circumstance suggested to the physician that a deficiency of wholesome air was connected with the great mortality. Air pipes, with other openings, were contrived: the rooms were freely ventilated; and behold the consequences:—

In 1786, of 1,372 children	there died	51
In 1787, of 1,375	,,	59
(An unhealthy season.)		
In 1788, of 1,496	,,	55
4,243		165

Thus, after a proper application of ventilation out of 4,243 children there died 165; whereas the average previously from the same number, in the same place, was 1,632.

THE BURMESE BELL AT LIVERPOOL.—This gigantic bell, which was one of the spoils taken during the Burmese war, and is now erected on the Liverpool Landing-stage, for the purpose of giving warning during a fog, is found not to emit so loud a sound as was anticipated, and therefore proves to be comparatively useless. The metal is so thick that an ordinary clapper is wholly ineffectual in bringing out the full tone of the bell, which requires a power equal to that of a steam-hammer to ring it effectually. In the endeavour to bring out the sound in all its power, the tongue or clapper was several times unshipped, and fell upon the landing-stage, making indentations nearly an inch deep upon the oak floor, but providentially doing no other damage.

INFORMATION FOR HOUSE-AGENTS.—Mr. Craven, as agent for Mr. Robinson, summoned Mr. Thorpe of Brunswick-street, Tranmere, on Friday, at the Birkenhead County Court, for the sum of 3*l.* 14s. 3d. including costs, being a quarter's rent for a house belonging to Mr. Robinson, and which Mr. Thorpe had occupied for part of a quarter. The defendant had let the house to another party, whom Mr. Craven accepted as a tenant, and upon quitting the house tendered to Mr. Craven the full amount of the rent then due, viz.. 1*l.* 5s. 6d., which he refused to accept, and he also refused to give a receipt in full of all demands. The learned judge ruled that Mr. Craven had no right to refuse giving the receipt, and gave a verdict for the defendant.

DEATH IN A SEWER.—At Bolton, on Friday week, a boy died in a pipe sewer, into which he was sent by a man employed by the subsurveyor to cleanse a length of eighty yards. The subsurveyor had expressed a doubt of its being properly cleansed, and two boys were sent through it to prove that it was so. A shaft was hastily sunk to extricate the youth, but eleven hours elapsed ere his body was got. The pipe in which it was found was filled with sludge to the depth of 13 inches, the vacant space at top being only 7 inches. The coroner's jury reprimanded the man who had sent the boys in for urging them to go through.

NEW ALMSHOUSES IN ST. LEONARD'S, SHOREDITCH.—According to the newspapers, the first stone of new almshouses in Brunswick-street, Hackney-road, for twenty poor women of the parish of St. Leonard, Shoreditch, has been laid. A sufficient sum has now been obtained by voluntary subscriptions to enable the committee to enter into a contract with Mr. John Wood, of Shaftesbury-street, to erect and roof the houses, build a wall, and place the iron railings thereon, for a thousand guineas: to finish the houses, fit for residence, however, a further sum of about two hundred and fifty pounds will be required. The building is to be constructed on a square, with two fronts, in a mixed style of architecture, combining the Elizabethan and Stuart, and surrounded by a verandah. Each inmate is to have a living-room, a sleeping-room, and scullery. Mr. Knightley is the architect.

MAGNETO-ELECTRIC AND ELECTRO-MAGNETIC APPARATUS.—Mr. W. Millward, of Birmingham has lately specified a patent, which consists—1. Of an improved method of charging or magnetising iron and steel bars to be used as permanent magnets or electro-magnets.—2. Of certain new forms of electro-magnetic machines. The first branch of the improvements is carried into effect by the employment of an electro-magnet formed by a current of electricity produced from a magneto-electric machine, instead of that generated in a voltaic battery; and such an electro-magnet, it is said, may be very advantageously used for magnetising large bars of steel, or for producing very powerful magnets. Any of the known forms of magneto-electric machines will serve thus to convert a bar of steel into an electro-magnet, but the patentee prefers to use one composed of four, eight, or any other number of permanent magnets, having double the number of armatures, and coiled with strong wire of about 60 feet in length.——Mr. F. S. Beatty, of Dublin, advertises an "electro-magnetic engine as a source of mechanical power, to supersede the use of steam as a prime mover," and expresses his desire to treat with capitalists in order to form a company, to be called "The British Electric Power Company."——M. Aristides Dumont, engineer of the Ponts et Chaussées, has made some experiments with electro-magnetic engines, for the Paris Academy of Sciences. He concludes from these experiments that although electro-magnetism cannot compete with steam, small power machines might be usefully turned to account in many trades, and for numerous mechanical operations where moderate forces only are required.

RUSSIAN USE OF DOOR-LOCKS.—"But he laid particular emphasis on the brass door-latches, which in Armenian houses are somewhat unheard of. With these door-latches and locks a comical story is connected. The Prince became acquainted with the use of them at Tiflis, bought a dozen, and ordered some to be fixed on the doors of the "European saloon." The servants of the house, ignorant of the real intent of the singular machines, believed that the Prince had ordered them for musical purposes; for every time they were turned a roaring sound followed in the wide, empty room. It happened, then, that in the absence of the master of the house, several concerts were arranged by the domestic *personnel*, with the assistance of the brass door-latches. An old blind Tartar had to sing, and the cook, who was considered an authority in such matters, played the brass door-latches. The Prince only discovered the musical tendencies of his household when three locks and latches were broken. 'So difficult is it,' said he, concluding a very copious narration of the affair,—'so difficult is it to introduce into this country European civilization. But I do not perplex myself on that account, and have brought with me half-a-dozen new door-locks from Tiflis.'" —*Bodenstedt's Morning-Land.*

NEW CHURCH IN WATERLOO-ROAD.—A new church in Waterloo-road, nearly opposite the Victoria Theatre, has been erected for a congregation formerly in Robinson's school-room, close by. It is built of Kentish rag stone, in the Gothic style, with a small steeple, containing a bell.

ROE'S COMBINATION PAVING.—Mr. Freeman Roe has patented a new mode of constructing roads, the object of which is to give greater stability, and to diminish the expense. He proposes to substitute for the present bed of concrete now generally laid for the support of the granite, permanent wooden sleepers, supporting a covered way of the same material, and forming the segment of a circle, and upon this to rest the granite block. When it is necessary to open the road for laying down or mending pipes or other purposes, the woodwork in that part, it is stated, is easily removed, and as easily replaced in the same position as it was previous to its being disturbed. The advantages claimed are, that it is cheaper than the present mode of paving; will better preserve uniformity of surface; and will mitigate the noise in the streets.

PULHAM'S TERRA COTTA, in Class 27 of the Great Exhibition, seems a very good material, and deserves notice. The maker has added, at the west end, several fresh specimens since we gave our general review of the works in this class. In a statement which Mr. Pulham has put forth, it appears that a piece of his terra cotta, broken by Mr. Bellhouse's hydraulic press, required a pressure equal to the enormous force of 460 tons on the foot cube. The application of terra cotta to the construction of fire-proof staircases ought to have attention.

FALL OF A CORNICE AT PIMLICO.—Four men were killed on Friday last by the fall of an exterior cornice newly erected on a building of five stories and nearly 80 feet in length, forming three houses in course of erection near Vauxhall-bridge, by Mr. Grigg, builder. The whole of the cornice fell in one piece, carrying the whole of the stage with it, and snapping the scaffold-poles, precipitating the workmen to the ground.

PROPERTY RATED TO THE POOR.—Some interesting information is given in a return recently issued respecting property assessed to the relief of the poor in the several parishes of the metropolis in the rate collected in June last. The value was 9,760,200*l.*, which was made up in the following manner, showing the value of the property in the several districts:—In Hammersmith the rateable value of the property in four parishes was 139,547*l.* In Chelsea, three parishes, 394,594*l.* In Paddington, two parishes, 389,987*l.* In Marylebone, two parishes, 906,160*l.* In Westminster, twenty-two parishes and extra parochial places, 1,810,814*l.* In St. Pancras, two parishes, 704,517*l.* In Holborn, nineteen parishes and extra parochial places, 985,399*l.* In Shoreditch, nine parishes, 691,670*l.* In Spitalfields, six parishes, 419,852*l.* In the Tower Hamlets, thirteen parishes, 223,474*l.* In Limehouse, five parishes, 263,641*l.* In the City of London, 105 parishes, 877,766*l.* In Battersea, twelve parishes, 231,132*l.* In Lambeth, five parishes, 559,856*l.* In Camberwell, four parishes, 369,238*l.* In Southwark, nine parishes, 477,598*l.*; and in Greenwich, six parishes, 315,561*l.*, making the grand total of 9,760,206*l.*—*Times.*

THE VALUE OF THE THERMOMETER has been shown very strikingly at the Great Exhibition. Mr. Bennett, of Cheapside, has fixed there twenty of his standard thermometers in different parts of the building, and by diligently recording and communicating each day the varieties of temperature, enabled the Executive to adopt such measures to ensure comfortable breathing as the circumstances demanded. Mr. Bennett has not let the opportunity slip to bring himself into notice by this matter, and deserves for his energy whatever advantage may accrue to him.

MARSH-LAND BRIDGES.—In your paper of the past week you mention a little invention of mine, which you designate "cattle bridges;" but this is not the proper title or purpose of the bridge: I call it the "marsh-land bridge," and its worth consists in preventing cattle and sheep from passing over it, as in the case of a common bridge, whilst it affords the farmer and his men free range from field to field, over many hundred acres, at small expense. The mode of making them, as already stated by you, is correct.—NATHANIEL MATHEW.

BRICKMAKING EXTRAORDINARY.—A correspondent states that twelve moulders employed by Messrs. Herois and Rutter, in a field near Uxbridge, have made the enormous quantity of 10,875,000 bricks during the season of twenty-two weeks just ended. This quantity will give an average of 906,025 bricks for each moulder. One moulder made 1,046,000, and another made 1,023,000.

IRON TRADE IN STAFFORDSHIRE.—It is stated, in the *Birmingham Gazette*, that the most expensive descriptions of iron, for Birmingham orders, are being delivered there at 8*l.* per ton, and the lowest at about five guineas net. A report has been very general that an advance of 2s. 6d. per ton on pig iron has been established, but we are assured both by buyers and sellers that it is without foundation.

MANCHESTER IS TO BE A CITY.—We believe we may announce that, at the private meeting of the council on Wednesday last, it was determined that Manchester should be a city, and the mayor was authorised to take the requisite steps for making application for the grant of her Majesty's Royal letters patent, authorising and declaring that henceforth the incorporated borough and town of Manchester should take the name, style, or title of "the City of Manchester." We understand that the mayor has already made the requisite formal application, and that in a short time we may legally and correctly congratulate our "fellow-citizens" on the civic dignity conferred upon Manchester.—*Manchester Guardian.*

TENDERS

For works to Newington Workhouse. Quantities supplied. Mr. H. Jarvis, Architect.

Harding	£5,387 0 0
Overton	5,270 0 0
Paulin	5,100 0 0
Myers	5,050 0 0
Tarrent	4,994 0 0
Crawley	4,900 0 0
Davis	4,861 0 0
Brown	4,851 0 0
Taylor	4,800 0 0
Cooper	4,747 0 0
Carter	4,597 0 0
Rudkin	4,525 0 0
J. Cooper	4,450 0 0
Ryder	4,444 0 0
Wilson	4,377 0 0
Colls and Co.	4,374 13 0
Walker	4,350 0 0
Tombs	4,115 0 0

TO CORRESPONDENTS.

"*Planes.*"—Can any of our subscribers inform us *when planes were first invented?*

"J. B.," Chichester (thanks), "G. J. F.," "W. T.," "J. B. W.," "Mr. B.," "A Brick," "T. P.," "T. W.," "T. B.," "J. D. H.," "A Leaseholder" (adjoining owner should pay for the wall. Apply to an architect), "W. J. H." (we have already admitted a reply), "F. P. R.," "J. D.," "E. C.," "C. P.," "T.," "One who works for his living" (not precise enough, for such a charge), "A Constant Reader," "R. L."

"*Books and Addresses.*"—We have not time to point out books or find addresses.

NOTICE.—All communications respecting *advertisements* should be addressed to the "Publisher," and not to the "Editor;" all other communications should be addressed to the EDITOR, and *not* to the Publisher.

ADVERTISEMENTS.

BUILDERS' BENEVOLENT INSTITUTION.—FOURTH ANNIVERSARY DINNER, to be held at the London Tavern, on WEDNESDAY, October 29, 1851.

THOMAS GRISSELL, Esq., F.S.A., President, in the Chair.

STEWARDS.

Charles Balam, Esq.	Benj. Gough, Esq.	Wm. Norris, Esq.
N. Barnes, Esq.	Wm. Harding, Esq.	Thos. Patrick, Esq.
T. G. Bartlett, Esq.	George Head, Esq.	J. Pennethorne, Esq.
E. L. Betts, Esq.	J. N. Helling, Esq.	S. M. Peto, Esq., M.P.
Stephen Bird, Esq.	Wm. Herbert, Esq.	J. Randell, Esq. Bath.
George Bird, Esq.	Thos. Howard, Esq.	R. Richardson, Esq.
Joseph Bird, Esq.	Thos. Hockley, Esq.	G. S. Smith, Esq.
Messrs. Collins and Stanbury, Birmingham.	Wm. Hutchons, Esq.	Thos. Smith, Esq.
	Wm. Ifold, Esq.	J. Soward, Jun., Esq.
H. W. Cooper, Esq.	J. James, Esq.	R. Stanham, Esq.
Thomas Cubitt, M.P.	J. Jay, Esq.	Thos. Stirling, Esq.
Alderman Cubitt, M.P.	James Knight, Esq.	John Thorn, Esq.
Robt. L. Curtis, Esq.	William Lee, Esq.	Thos. Try, Esq.
Wm. Dennis, Esq.	Geo. Lever, Esq.	Thos. Tyerman, Esq.
Wm. Dunnage, Esq.	Benj. Mees, Esq.	Isaac Unwin, Esq.
William Ellis, Esq.	George Myers, Esq.	R. Watts, Jun., Esq.
E. B. Gammon, Esq.	Thomas Nesham, Esq	J. Williams, Esq.
	G. John Newson, Jun., Esq.	W. Woodward, Esq.

Gentlemen desirous of promoting the interests of the Institution by becoming Stewards will be pleased to forward their names to the Secretary, at the office, 476, New Oxford-street.

A. G. HARRIS, Secretary.

TO DRAUGHTSMEN AND CIVIL ENGINEERS.

H. MORRELL, BLACK LEAD PENCIL MANUFACTURER, No. 149, Fleet-street, London.

These Pencils are prepared in various degrees of hardness and shades.

H H H H for drawing on wood.	F F light and shading.
H H H for architectural use.	F for general use.
H H for engineering.	B black for shading.
H for sketching.	B B ditto ditto.
H B hard and black for drawing.	B B B ditto ditto.
M medium.	B B B B ditto ditto.

Sold by all the principal Stationers in town or country.

PARTNER WANTED.—An Architect in good practice in one of the most flourishing towns in England, whose time is chiefly occupied in superintending works, is desirous of engaging with a young Architect well acquainted with the general routine of his profession, capable of taking the management of the office business, and can give respectable references. As the offer is a very advantageous one, a moderate premium will be expected.—Address, APLHA, at Kent's Family Hotel, Norfolk-street, Strand.

DRAUGHTSMAN WANTED, to make finished and working drawings of suburban residences and assist in a land and estate agency business. A knowledge of Gothic detail is necessary.—Applications by letter in the first instance to T. W., 359, Strand.

WANTED, a STONEWARE POTTER, to make Socket, Junction, and other Pipes for town drainage.—Apply, by letter, to C. M., Post-office, Bridgewater.

WANTED immediately, several BRICKLAYERS, some of whom must have been accustomed to fire work.—Apply by letter postpaid, to B. Y., Watling's Newspaper Office, 409, Strand, London.

TO BUILDERS' CLERKS.

WANTED, in a Builder's Office, a respectable YOUTH, to keep the books; a knowledge of book-keeping and a good handwriting are indispensable.—Apply at No. 8, Bayham-terrace, Camden-town.

TO PLUMBERS.

WANTED, a Sober and Industrious Workman in the above line, to paint and glaze occasionally. References will be required. None but Good Workmen need apply, by letter only, post-paid, to J. L., No. 70, High-street, St Marylebone.

TO IRONMONGERS' ASSISTANTS.

WANTED, in an old-established Ironmonger's, in Westminster, a Youth as an IMPROVER, who has been about three years in the business. A small salary, with board, &c., will be given. None need apply whose character will not bear the strictest inquiry.—Address, stating particulars, to H. L., care of Mr. W. G. H., 31, Bridge-street, Southwark.

TO BUILDERS AND OTHERS.

WANTED, by the Advertiser, aged forty, a SITUATION as FOREMAN to plumbing, painting, and paperhanging; can measure and estimate if required.—Apply to J. H., No. 2, Suffolk-street, Pentonville.

TO ARCHITECTS, BUILDERS, AND CONTRACTORS.

WANTED, by a middle-aged Man, a SITUATION as CLERK of WORKS, or FOREMAN, having had many years' experience in building, theoretically and practically. No objections to country.—Address B. J., Office of "The Builder," 1, York-street, Covent-garden.

WANTED, a situation as BUILDER'S CLERK or CLERK of WORKS, by a practical man, who has had several years' experience in the business, also in office duties. Can measure up work, estimate and make plans. Good references.—Address, W. C., Mr. Billing's, No. 102, Tottenham-court-road.

TO BUILDERS, CONTRACTORS, AND OTHERS.

WANTED, a SITUATION by a Builder's Clerk, with a knowledge of materials, prices, &c. Can produce the cost of works progressing, and weekly, if required. No objection to temporary engagement upon works completed, or upon single or copartnership accounts. Terms moderate.—Address H. K., Brown's colour and varnish warehouse, 10, Goswell-street.

WANTED, an ENGAGEMENT, as FOREMAN, or to Manage the working of Saw-mills, or other machinery, or the Measuring and Converting of Timber for building or manufacturing purposes, by a steady Man, who practically understands the construction of buildings, erecting and working of machinery, and directing the most useful applications of steam-power, for planing, moulding, tenanting, groving, rebating, &c. Unexceptionable references. No objection to go abroad.—Address, G. H., Post-office, Essex-street, Islington.

TO ARCHITECTS, SURVEYORS, AND BUILDERS.

A SURVEYOR is in want of an ENGAGEMENT; either permanent or occasional assistance could be rendered as required.—Address, P. D., Office of "The Builder," 1, York-street, Covent-garden.

TO ARCHITECTS AND SURVEYORS.

AN ASSISTANT, who is a good and expeditious DRAUGHTSMAN, and who has had much practical experience in the Profession, is desirous of a RE-ENGAGEMENT. Salary not so much an object as a permanent situation. Satisfactory references can be given.—Address, H. A., Office of "The Builder," 1, York-street, Covent-garden.

TO ENGINEERS, BUILDERS, &c.

A GOOD DRAUGHTSMAN and general CLERK (long accustomed to railway works), is desirous of an ENGAGEMENT, in either town or country, is of strict business habits, and would be happy to make himself generally useful. Satisfactory testimonials.—Address, post-paid, R. A., Office of "The Builder," 1, York-street, Covent-garden.

TO PLUMBERS, BUILDERS, &c.

A CONSTANT SITUATION WANTED, by a person aged 40, as PLUMBER, or Plumber, Painter, and Glazier. Good reference can be given; five years in his last place.—Address, W. R., 29, Mansion-house-street, Lower Kennington-lane.

A STEADY and good MARBLE MASON, who is well accustomed to Chimney-piece and Tablet work, may have CONSTANT EMPLOYMENT in the country by addressing to Statuary, Office of "The Builder," 1, York-street, Covent Garden.

TO BUILDERS OR LANDLORDS.

A YOUNG MAN of experience is desirous of meeting with an ENGAGEMENT in the office of a Builder as MEASURER, ESTIMATOR, and DRAUGHTSMAN (having just left a large firm), or would undertake the superintendence of the erection of any buildings or houses. Partial occupation would not be objected to.—Address, Y. Z., Post-office, 123, Jermyn-street, St. James's.

TO TIMBER MERCHANTS, BUILDERS, AND OTHERS.

THE Advertiser, a Young Man, who has been for the last four years employed in a timber merchant's office, and who can introduce a connection, is desirous of an ENGAGEMENT. He has been accustomed to canvassing, selling by commission, and book-keeping. Satisfactory references can be given.—Address, P. P., 16, Wharton-street, Lloyd-square.

TO ARCHITECTS AND OTHERS INTERESTED IN THE ERECTION, RESTORATION, OR ENRICHMENTS OF CHURCHES.

TO BE SOLD, for delivery immediately after the close of the Exhibition, a very RICHLY-CARVED PERPENDICULAR GOTHIC SCREEN, in Wainscot Oak, executed expressly to show the superiority and accuracy of JORDAN'S PATENT MACHINE CARVING for such Works at the Great Exhibition. The screen is in the main avenue of the Crystal Palace (No. 80). Its size is about 18 feet wide and 13 feet high.—Applications for purchase of the screen, or other work at the same stand, to be made at JORDAN'S MACHINE CARVING WORKS, Belvedere-road, Lambeth, near the Suspension-bridge.

BRITISH ASSURANCE COMPANY, 2, King-street, Cheapside.

Chairman—SYDNEY SMIRKE, Esq., A.R.A.

The rates for both fire and life assurance are as low as can with safety be taken. The premiums for life assurance made payable to suit the convenience of the assured.—Prospectuses and all particulars may be had at the head office, or of any of the agents.

JOHN REDDISH, Manager.

ENGINEERS', MASONIC, and UNIVERSAL MUTUAL LIFE ASSURANCE SOCIETY. Head office, 345, Strand, London, opposite Waterloo-bridge.

Policies free of stamp duty to the assured.
Policies indisputable.
Medical referees paid by the Society.
Assignments and transfers registered free of charge.
All the profits to the assured.
Every known method of life assurance transacted.
Prospectuses and other information from
345, Strand. FREDERICK LAWRANCE, Actuary and Secretary.

London, suburban, and provincial Agents Wanted.

PROVISION FOR FAMILIES IN CASE OF DEATH; ENDOWMENTS FOR CHURCHES, CONVENTS, AND SCHOOLS, BY MEANS OF ASSURANCE.

THE CATHOLIC LAW and GENERAL LIFE ASSURANCE COMPANY, 8, New Coventry-street, Leicester-square, London; 15, Bachelor's-walk, Dublin; and 18, Rue Tronchet, Paris. Incorporated under 7 & 8 Vict. c. 110.

CAPITAL 200,000*l.*

This Company assures diseased as well as healthy lives for sums of from 5*l.* to 5,000*l.*
The annual income is nearly 4,000*l.*
Lives declined by other offices accepted at equitable rates.
Prospectuses, proposals, and every information furnished on application to the Actuary or Secretary.

WILLIAM HENRY ARCHER, Actuary.
WILLIAM NORRIS, Secretary.

LIFE ASSURANCE for the WORKING- CLASSES.

BRANCH OFFICE—2, EXETER 'CHANGE, WELLINGTON STREET NORTH (opposite Waterloo-bridge), STRAND.

Open every Evening from Six till Eight o'clock.

Subscription for securing payments of 5*l.* and up to 50*l.* payable on death of subscriber, may be made upon the following terms, certified by the Actuary of the Company, W. H. Archer, Esq.:—

Weekly Contributions for payment of 5*l.* at death.

Healthy persons whose age on becoming subscribers shall be—

From 10 to 35 years, to pay One Penny per Week.
" 35 to 45 " " Twopence "
" 45 to 55 " " Threepence "

Collectors call at the houses of Subscribers for these weekly subscriptions.

The rate of subscription will not increase as the contributor grows older, but the same weekly amount paid at the commencement will be continued throughout life.

Subscribers may make from one to ten subscriptions, so as to secure the sum of Five, Ten, Fifteen, Twenty, and so on up to Fifty Pounds.

N.B. No communications relative to the assurance of sums from 5*l.* to 50*l.* can be attended to unless addressed to Mr. JOHN MOLYNEUX, 2, Exeter 'Change, Wellington-street North, Strand.

IMPORTANT to BUILDERS.—LAW PROPERTY ASSURANCE and TRUST SOCIETY, 30, Essex-street, Strand, London.

Subscribed Capital, 250,000*l.* in 5,000 Shares of 50*l.* each.

DIRECTORS:

Ralph Thomas Brockman, Esq., Folkestone.
Benjamin Chandler, jun., Esq., Sherborne.
Edward W. Cox, Esq., 36, Russell-square.
James Macaulay, Esq., 28, Chancery-lane.
Henry Paull, Esq., 33, Devonshire-place, Portland-place.
Robert Young, Esq., Battle.

This Society is established to apply the principle of Assurance to Property as well as to Life; and its business consists of—

I. PROPERTY.	II. LIFE.
Assurance of Leaseholds.	Assurance of Healthy, Diseased, and Doubtful Lives.
Redemption of Mortgages and Loans.	Education Assurance.
Assurance of Copyholds.	Granting of Annuities.
Assurance of Lifeholds.	Granting Present Annuities in Exchange for Reversionary Interests.
Assurance of Titles.	Guarantee of the Fidelity of Clerks, Servants, and Persons required to give Security.
Assurance of Building Societies	
Collection and Guarantee of Rents.	
Management of Trusts.	
Loans on the Plan of Building Societies.	

POLICIES INDISPUTABLE.

Prospectuses, Forms of Proposal, and every information will be immediately furnished on application to WILLIAM NEISON, Esq., Actuary and Secretary, 30, Essex-street, Strand, London.

PROVIDENT LIFE OFFICE, 50, Regent-street; City Branch: 2, Royal Exchange-buildings.—Established 1806. Policy-holders' Capital, 1,192,818*l.* Annual Income, 150,000*l.* Bonuses declared, 743,000*l.* Claims paid since the establishment of the Office, 2,001,450*l.*

PRESIDENT.—The Right Honourable EARL GREY.

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HENRY BLENCOWE CHURCHILL, Esq., Deputy-Chairman.

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Thomas Maugham, Esq.	Capt. William John Williams.

J. A. Beaumont, Esq., Managing Director.

PHYSICIAN.—John Maclean, M.D., F.S.S., 29, Upper Montague-street, Montague-square.

Nineteen Twentieths of the Profits are divided among the Insured.

EXAMPLES OF THE EXTINCTION OF PREMIUMS BY THE SURRENDER OF BONUSES.

Date of Policy.	Sum Insured.	Original Premium.	Bonuses added subsequently, to be further increased annually.
	£.	£. s. d.	£. s. d.
1806	2,500	79 10 10 extinguished.	1,223 3 0
1811	1,000	33 19 2 ditto	231 17 8
1818	1,000	34 16 10 ditto	114 18 10

EXAMPLES OF BONUSES ADDED TO OTHER POLICIES.

Policy No.	Date.	Sum Insured.	Bonuses added.	Total with additions to be further increased.
		£	£ s. d.	£ s. d.
521	1807	900	983 12 1	1,883 12 1
1174	1810	1,200	1,160 5 6	2,360 5 6
3366	1820	5,000	3,558 17 8	8,558 17 8

Prospectuses and full particulars may be obtained upon application to the Agents of the Office in all the principal towns of the United Kingdom; at the City Branch; and at the head Office, No. 50, Regent-street.

BRITISH MUTUAL LIFE OFFICE.—The Public are invited to examine for themselves the advantages gained for Assurers by the plan on which policies are granted by this Office.—Apply to CHARLES JAMES THICKE, Secretary, 17, New Bridge-street, Blackfriars.

MITRE GENERAL LIFE ASSURANCE ASSOCIATION, 23, Pall-mall.

Tables, based on the experience of 62,000 assurers.
Short term policies extended to the whole of life.
Loans granted to benefiecd clergymen on personal security, combined with a life policy effected with the Association.

W. BRIDGES, Actuary and Secretary.

ESTABLISHED 1841.

MEDICAL, INVALID, and GENERAL LIFE OFFICE, 25, Pall-Mall.

During the Ten Years this Society has been established, more than Three Thousand Two Hundred Policies have been issued.—Covering Assurances to the extent of Thirteen Hundred Thousand Pounds.—

Yielding Annual Premiums amounting to upwards of Fifty-three Thousand Pounds.

This Society is the only one possessing Tables for the Assurance of Diseased Lives.

Healthy Lives assured at lower rates than at most other Offices.

A Bonus of 2 per cent. per annum was added to the policies at last Division of Profits.

Agents wanted.

Prospectuses, Forms of Proposal, and every other information, may be obtained of the Secretary at the Chief Office, or on application to any of the Society's Agents in the country.

F. G. P. NEISON, Actuary.
C. DOUGLAS SINGER, Secretary.

UNION ASSURANCE OFFICE (Fire, Life, Annuities), Cornhill and Baker-street, London; College-green, Dublin; and Gronenger-street, Hamburgh; instituted A.D. 1714.

Life.—Reduced rates for young and middle ages, with the guarantee of a Company in existence for nearly 140 years.

The last bonus (1848) gave additions to policies varying from 25 to 70 per cent. on the previous seven years' premiums.

Lower rates without profits.

Two-thirds only of the premium may be paid until death.

Decreasing and increasing rates of premium, and half-yearly or quarterly.

Loans granted. Medical fees allowed.

Fire insurances at the usual rates, and profits returned on policies taken out for seven years by prompt payment.

March 7, 1851. THOMAS LEWIS, Secretary.

FAMILY ENDOWMENT LIFE ASSURANCE AND ANNUITY SOCIETY, 12, Chatham-place, Blackfriars, London, and at Calcutta.

CAPITAL, 500,000*l.*

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Thirty per cent. Bonus was added to the Society's Policies on the profit scale in 1845. The next valuation will be in January, 1852.

Loans are granted on mortgage and on security of Life Interests and Reversions.

INDIA BRANCH.

The Society has extensive Indian business, and grants Policies of Insurance, Deferred Annuities, and Endowments, in Calcutta, Madras, and Bombay, to members of the Civil and Military Services, and others. Parties calling at the Office will be furnished with full particulars, to which the attention of Parents and Guardians of Youths proceeding to India is especially invited.

JOHN CAZENOVE, Secretary.

PHŒNIX FIRE ASSURANCE COMPANY, Lombard-street, and Charing-cross, London. Established in 1782.

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Insurances against Loss by Fire are effected by the PHŒNIX COMPANY upon every description of Property, in every part of the World, on the most favourable Terms.

Persons insuring with the PHŒNIX COMPANY are not liable to make good the losses of others, as is the case in some offices.

Insurances with this Company expiring at Michaelmas must be renewed within Fifteen days thereafter, or they will become Void.

Receipts are now ready at the principal Offices, Lombard-street and Charing-cross, and with the respective Agents throughout the United Kingdom.

LIGHTERAGE.—To Saw-Mill Proprietors, Timber, Slate, and Stone Merchants, or others, requiring Lighterage.—The Advertiser having a large number of Barges, is willing to undertake LIGHTERAGE at prices that defy competition.—CHARLES STRUTTON, 34, Commercial-road, Lambeth.

TARPAULINS for COVERING ROOFS during Repairs, SCAFFOLD CORD and every description of ROPE used by Builders upon the lowest terms. Marquees and temporary Awnings on sale or hire. Orders per post receive the most prompt attention.—WILLIAM PIGGOTT, 115, Fore Street, City, Manufacturer, by Appointment to Her Majesty's Honourable Board of Ordnance.

NEW SHOW-ROOMS FOR BED-STEADS.—HEAL and SON have erected some extensive Warerooms for the purpose of keeping every description of Bedstead. In iron their stock will include every sort manufactured, from the cheap stump, for servants' use, to the handsomely ornamented tubular-pillared Canopy, as well as Brass Bedsteads of every shape and pattern; and in Wooden Bedsteads their rooms are sufficiently extensive to allow them to fit up a variety, both in Polished Birch and Mahogany, of Four-post, Canopy, and French, and also of Japanned Bedsteads—in fact, to keep in stock every sort of Bedstead that is made; and they have also a general assortment of Furniture Chintzes, Damasks, and Dimities, so as to render their stock complete for the Furnishing of Bedsteads as well as Bedding. And without attempting to compete with the prices at which the lowest class of Furniture is sold, and which is fit for no useful purpose, their new stock will be found to be priced on the same principle by which their Bedding Trade has, during the last thirty years, been so successfully extended, and the goods, whether of a plain and simple pattern, or of a handsomer and more expensive character, are of well-seasoned materials, sound workmanship, and warranted.

HEAL and SON'S List of Bedding, containing full particulars of Weights, Sizes, and Prices of every description of Bedding, sent free by post, on application to their factory.

196 (opposite the Chapel), Tottenham-court-road, London.